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PI/PD Name: Chitta R Baral

Gender: ☒ Male ☐ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino ☒ Not Hispanic or Latino

Race: (Select one or more)
- ☐ American Indian or Alaska Native
- ☒ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

Disability Status: (Select one or more)
- ☐ Hearing Impairment
- ☐ Visual Impairment
- ☐ Mobility/Orthopedic Impairment
- ☐ Other
- ☒ None

Citizenship: (Choose one) ☒ U.S. Citizen ☐ Permanent Resident ☐ Other non-U.S. Citizen

Check here if you do not wish to provide any or all of the above information (excluding PI/PD name): ☒

REQUIRED: Check here if you are currently serving (or have previously served) as a PI, co-PI or PD on any federally funded project ☒

Ethnicity Definition:
Hispanic or Latino. A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race.
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American Indian or Alaska Native. A person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment.
Asian. A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.
Black or African American. A person having origins in any of the black racial groups of Africa.
Native Hawaiian or Other Pacific Islander. A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
White. A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

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PI/PD Name: Birte Glimm

Gender: ☐ Male ☒ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino ☒ Not Hispanic or Latino

Race: (Select one or more)
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

Disability Status: (Select one or more)
- ☐ Hearing Impairment
- ☐ Visual Impairment
- ☐ Mobility/Orthopedic Impairment
- ☐ Other
- ☐ None

Citizenship: (Choose one) ☐ U.S. Citizen ☐ Permanent Resident ☒ Other non-U.S. Citizen

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PI/PD Name: Marco Maratea

Gender: ☐ Male ☐ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino ☐ Not Hispanic or Latino

Race: (Select one or more)
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

Disability Status: (Select one or more)
- ☐ Hearing Impairment
- ☐ Visual Impairment
- ☐ Mobility/Orthopedic Impairment
- ☐ Other
- ☐ None

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PI/PD Name: Adrian Pearce

Gender: ☒ Male ☐ Female

Ethnicity: (Choose one response) ☐ Hispanic or Latino ☐ Not Hispanic or Latino

Race: (Select one or more)
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☒ White

Disability Status: (Select one or more)
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List of Suggested Reviewers or Reviewers Not To Include (optional)

SUGGESTED REVIEWERS:
Not Listed

REVIEWERS NOT TO INCLUDE:
Not Listed

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 14-1

NSF 14-1

FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.)

IIS - ROBUST INTELLIGENCE

FOR NSF USE ONLY

NSF PROPOSAL NUMBER

1441741

DATE RECEIVED	NUMBER OF COPIES	DIVISION ASSIGNED	FUND CODE	DUNS# (Data Universal Numbering System)	FILE LOCATION
03/26/2014	1	05020000 IIS	7495	943360412	08/26/2014 10:20am S

EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN)

860196696

SHOW PREVIOUS AWARD NO. IF THIS IS
☐ A RENEWAL
☐ AN ACCOMPLISHMENT-BASED RENEWAL

IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES ☐ NO ☒ IF YES, LIST ACRONYM(S)

NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE

Arizona State University

AWARDEE ORGANIZATION CODE (IF KNOWN)

0010819000

ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE

Arizona State University
ORSPA
Tempe, AZ. 852816011

NAME OF PRIMARY PLACE OF PERF

Arizona State University

ADDRESS OF PRIMARY PLACE OF PERF, INCLUDING 9 DIGIT ZIP CODE

Arizona State University
699 S. Mill Ave
Tempe ,AZ ,852878809 ,US.

IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions)
☐ SMALL BUSINESS ☐ MINORITY BUSINESS ☐ FOR-PROFIT ORGANIZATION ☐ WOMAN-OWNED BUSINESS

☐ IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE

TITLE OF PROPOSED PROJECT **Student Travel Grant: 2014 Principle of Knowledge Representation and Reasoning Conference and Doctoral Consortium**

REQUESTED AMOUNT	PROPOSED DURATION (1-60 MONTHS)	REQUESTED STARTING DATE	SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE
$ 15,000	12 months	05/01/14	

THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW

☐ BEGINNING INVESTIGATOR (GPG I.G.2)
☐ DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C.1.e)
☐ PROPRIETARY & PRIVILEGED INFORMATION (GPG I.D, II.C.1.d)
☐ HISTORIC PLACES (GPG II.C.2.j)
☐ VERTEBRATE ANIMALS (GPG II.D.6) IACUC App. Date _____
PHS Animal Welfare Assurance Number _____
☒ FUNDING MECHANISM **Conference, Symposium, Workshop**

☐ HUMAN SUBJECTS (GPG II.D.7) Human Subjects Assurance Number _____
Exemption Subsection _____ or IRB App. Date _____
☐ INTERNATIONAL ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j)

☒ COLLABORATIVE STATUS
Not a collaborative proposal

PI/PD DEPARTMENT
Dept of Computer Science and Engineering

PI/PD POSTAL ADDRESS
Box 878809
Tempe, AZ 852878809
United States

PI/PD FAX NUMBER
480-965-2751

NAMES (TYPED)	High Degree	Yr of Degree	Telephone Number	Email Address
PI/PD NAME **Chitta R Baral**	**PhD**	**1991**	**480-727-6047**	**chitta@asu.edu**
CO-PI/PD **Birte Glimm**	**DPhil**	**2008**	**004-973-1502**	**birte.glimm@uni-ulm.de**
CO-PI/PD **Marco Maratea**	**PhD**	**2005**	**010-353-2144**	**marco.maratea@unige.it**
CO-PI/PD **Adrian Pearce**	**DEng**	**1997**	**BadPhoneNo44**	**adrianrp@unimelb.edu.au**
CO-PI/PD				

CERTIFICATION PAGE

Certification for Authorized Organizational Representative (or Equivalent) or Individual Applicant

By electronically signing and submitting this proposal, the Authorized Organizational Representative (AOR) or Individual Applicant is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding conflict of interest (when applicable), drug-free workplace, debarment and suspension, lobbying activities (see below), nondiscrimination, flood hazard insurance (when applicable), responsible conduct of research, organizational support, Federal tax obligations, unpaid Federal tax liability, and criminal convictions as set forth in the NSF Proposal & Award Policies & Procedures Guide,Part I: the Grant Proposal Guide (GPG). Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U.S. Code, Title 18, Section 1001).

Certification Regarding Conflict of Interest

The AOR is required to complete certifications stating that the organization has implemented and is enforcing a written policy on conflicts of interest (COI), consistent with the provisions of AAG Chapter IV.A.; that, to the best of his/her knowledge, all financial disclosures required by the conflict of interest policy were made; and that conflicts of interest, if any, were, or prior to the organization's expenditure of any funds under the award, will be, satisfactorily managed, reduced or eliminated in accordance with the organization's conflict of interest policy. Conflicts that cannot be satisfactorily managed, reduced or eliminated and research that proceeds without the imposition of conditions or restrictions when a conflict of interest exists, must be disclosed to NSF via use of the Notifications and Requests Module in FastLane.

Drug Free Work Place Certification

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent), is providing the Drug Free Work Place Certification contained in Exhibit II-3 of the Grant Proposal Guide.

Debarment and Suspension Certification

(If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency? Yes ☐ No ☒

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) or Individual Applicant is providing the Debarment and Suspension Certification contained in Exhibit II-4 of the Grant Proposal Guide.

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding $100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding $150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:
(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, ''Disclosure of Lobbying Activities,'' in accordance with its instructions.
(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

Certification Regarding Nondiscrimination

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is providing the Certification Regarding Nondiscrimination contained in Exhibit II-6 of the Grant Proposal Guide.

Certification Regarding Flood Hazard Insurance

Two sections of the National Flood Insurance Act of 1968 (42 USC §4012a and §4106) bar Federal agencies from giving financial assistance for acquisition or construction purposes in any area identified by the Federal Emergency Management Agency (FEMA) as having special flood hazards unless the:
(1) community in which that area is located participates in the national flood insurance program; and
(2) building (and any related equipment) is covered by adequate flood insurance.

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) or Individual Applicant located in FEMA-designated special flood hazard areas is certifying that adequate flood insurance has been or will be obtained in the following situations:
(1) for NSF grants for the construction of a building or facility, regardless of the dollar amount of the grant; and
(2) for other NSF grants when more than $25,000 has been budgeted in the proposal for repair, alteration or improvement (construction) of a building or facility.

Certification Regarding Responsible Conduct of Research (RCR)
(This certification is not applicable to proposals for conferences, symposia, and workshops.)

By electronically signing the Certification Pages, the Authorized Organizational Representative is certifying that, in accordance with the NSF Proposal & Award Policies & Procedures Guide, Part II, Award & Administration Guide (AAG) Chapter IV.B., the institution has a plan in place to provide appropriate training and oversight in the responsible and ethical conduct of research to undergraduates, graduate students and postdoctoral researchers who will be supported by NSF to conduct research. The AOR shall require that the language of this certification be included in any award documents for all subawards at all tiers.

CERTIFICATION PAGE - CONTINUED

Certification Regarding Organizational Support

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that there is organizational support for the proposal as required by Section 526 of the America COMPETES Reauthorization Act of 2010. This support extends to the portion of the proposal developed to satisfy the Broader Impacts Review Criterion as well as the Intellectual Merit Review Criterion, and any additional review criteria specified in the solicitation. Organizational support will be made available, as described in the proposal, in order to address the broader impacts and intellectual merit activities to be undertaken.

Certification Regarding Federal Tax Obligations

When the proposal exceeds $5,000,000, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Federal tax obligations. By electronically signing the Certification pages, the Authorized Organizational Representative is certifying that, to the best of their knowledge and belief, the proposing organization:
(1) has filed all Federal tax returns required during the three years preceding this certification;
(2) has not been convicted of a criminal offense under the Internal Revenue Code of 1986; and
(3) has not, more than 90 days prior to this certification, been notified of any unpaid Federal tax assessment for which the liability remains unsatisfied, unless the assessment is the subject of an installment agreement or offer in compromise that has been approved by the Internal Revenue Service and is not in default, or the assessment is the subject of a non-frivolous administrative or judicial proceeding.

Certification Regarding Unpaid Federal Tax Liability

When the proposing organization is a corporation, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Federal Tax Liability:

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that the corporation has no unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

Certification Regarding Criminal Convictions

When the proposing organization is a corporation, the Authorized Organizational Representative (or equivalent) is required to complete the following certification regarding Criminal Convictions:

By electronically signing the Certification Pages, the Authorized Organizational Representative (or equivalent) is certifying that the corporation has not been convicted of a felony criminal violation under any Federal law within the 24 months preceding the date on which the certification is signed.

AUTHORIZED ORGANIZATIONAL REPRESENTATIVE	SIGNATURE	DATE
NAME **Hayley Bohall**	**Electronic Signature**	**Mar 26 2014 4:28PM**

TELEPHONE NUMBER	EMAIL ADDRESS	FAX NUMBER
480-967-3721	**Hayley.Burns@asu.edu**	**480-965-2455**

PROJECT SUMMARY

Overview:

While thoughts and discussions on Knowledge Representation and Reasoning (KR&R) go back to the early philosophers, the importance of KR&R in building intelligent systems was realized from the very beginning of the field of Artificial Intelligence (AI). This recognition and subsequent research on KR&R as an important aspect of AI was apt, as the two key aspects of "intelligence" - learning and reasoning - are centered on knowledge; one learns knowledge and one reasons with knowledge. This led to the questions: What is knowledge and how does one represent knowledge? Since the early days of AI, developing appropriate knowledge representation (KR) formalisms, developing building block results around existing KR formalisms, developing reasoning systems around KR formalisms and using KR formalisms in various applications have been important research areas.

In recent years significant progress has been made in KR. There are now several KR formalisms with strong support structures, theoretical underpinnings, implemented systems and many applications built using them. Large-scale applications, many built outside of academia, together with some international standards for KR languages developed by the World Wide Web Consortium, promise to provide significant added value to businesses and individuals alike. Major IT companies, such as IBM, Google, Apple and Facebook, as well as application developers, have taken advantage of the effort on knowledge representation by drawing on available KR tools and technologies. Recognizing this importance of KR, a Workshop on Research Challenges and Opportunities in KR was organized by NSF in Spring 2013.

The demands on graduate students entering the area of KR are high. A successful student needs to develop both the formal and mathematical underpinnings of multiple KR formalisms, as well as needs to address software engineering issues such as scalability. It is therefore of great importance that graduate students have the opportunity to discuss ideas, trends, and technical aspects with key researchers in the area, to start developing their professional contacts, and to extend their knowledge of the state of the art. The primary and most effective way to do this is to participate in key scientific conferences and interact with other researchers working in the field.

The Principles of KR&R conference series, established in 1989, is driven by some of the key researchers in the field of KR, and attracts a substantial number of highly visible researchers and submissions each year. In response to the high demands on graduate students in this area, the conference has established a practice of a Doctoral Consortium event during the conference, where students can deeply interact with the researchers, and is pursuing options to further enhance the educational aspect of its events.

In this proposal, we request NSF support for promising US students to attend the Doctoral Consortium of the conference. A dedicated mentoring program and other student-centered events will be put in place for the maximum benefit of the participating students.

Intellectual Merit :

The proposed activity addresses a bottleneck in student education in the field of KR and Reasoning. The PIs are among the main drivers of the conference series. They are established researchers with high visibility and proven track record of successful student mentoring. The conference is a premier event attended by prominent researchers in the area. The grant will allow participation of US students in the doctoral consortium of the conference and will help in enhancing the KR research base in the US.

Broader Impacts :

The proposed activity furthers technological advancement in the emerging area of KR and reasoning, which is currently seeing substantial industrial interest. This is achieved through the enhancement of next generation computer scientists, with long-term benefits both to industry and academia. Actions will be implemented in order to broaden the KR and Reasoning visibility, by trying to attract students from ?new? research groups, and underrepresent groups.

TABLE OF CONTENTS

For font size and page formatting specifications, see GPG section II.B.2.

*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

1 Introduction: Motivation, Objective and Significance

The goal of this project is to enhance the education of selected US graduate students in the research area of Knowledge Representation and Reasoning. This will be realized by enabling them to attend the doctoral consortium of the 2014 Principles of Knowledge Representation and Reasoning Conference, which will include specially organized events for these students.

An important focus of this conference is to improve student education in the field of Knowledge Representation and Reasoning (KR&R). The PI and co-PIs are are highly visible in the KR&R community, and established researchers with a track record of successful student mentoring. The conference organization and governance includes many prominent researchers in the area. The conference will help nurture the next generation of KR&R researchers by enabling students to meet senior researchers at the conference and take part in face-to-face discussions with them.

The proposed activity furthers technological advancement in the emerging area of KR&R, which is currently seeing substantial industrial interest. Supporting the educational mission of the conference will bring long-term benefits both to industry and academia.

This year particular attention to diversity and inclusion will be paid, by implementing actions to attract students from groups underrepresented in the conference. In later section we will elaborate on the planned specific actions.

2 Knowledge Representation & Reasoning & Its Educational Need

The explosion of data and knowledge available in the last decade, with the consequent shift in the amount of data, in the way that scientists distribute, store, and aggregate this data, provided new challenges for knowledge representation and reasoning field. Thanks to these needs, methodologies developed by the researchers in knowledge representation and reasoning are key drivers of innovation in computer science, and they have led to significant advances in practical applications in a wide range of areas ranging from natural-language processing to robotics, to software engineering. Emerging fields such as semantic web, computational biology, software agents, question-answering systems, social computing, and many others rely on and contribute to advances in knowledge representation and reasoning, emphasizing the opportunity for practitioners in those fields to affect directions in which KR research proceeds. Following are some examples of recent successes of KR methodologies in various fields.

One of the big application area of KR is Semantic Web. Semantic Web [16] is based on the idea of *representing* the meaning—or semantics—of data on the Web using metadata (i.e., data that describes other data) in the form of ontologies [16]. Ontologies are represented using knowledge representation languages based on formal logic, and one of their key features is that they enable access to implicit knowledge through formal logical *reasoning* [18]. The World Wide Web Consortium has established several standards for such KR languages, primarily the Web Ontology Language OWL [15], which is based on Description Logics [1], the Rule Interchange Format RIF [6, 7] based on rules and logic programming [17, 22], and the Resource Description Framework RDF [26] including RDF Schema [8]. Research on these KR languages is a very active field of research and development, in matters concerning both foundations and applications, with significant industrial interest and investment. The interest in logic programming, another KR programming paradigm, for dealing with incomplete and inconsistent knowledge on the Web is also being investigated [29, 19].

Other success stories of KR, include (but are not limited to) "KR-Lite in deployed systems and standards" and "Applications of advanced KR methods outside of KR" (this characterization is borrowed from [30]). The "KR-Lite" applications, defined as using "simple" knowledge representation and reasoning, include the question-answering system Watson [9], the intelligent assistant Siri embedded in Apple phones, Google knowledge graph and Facebook graph search. Applications outside of KR include robotics applications that rely on advances in knowledge reasoning methods and technology, applications that use ontologies for dealing with "Big data" (e.g., from biology and medicine), and the Space Shuttle using the USA-Advisor [2] reasoning system.

For a wider view on successfully KR applications, opportunities and challenges we point to the report of the NSF Workshop on "Research Challenges and Opportunities in Knowledge Representation" [30] (available at `http://krnsfworkshop.cs.illinois.edu/final-workshop-report`).

To realize the economic potential of KR it is necessary to educate a significant number of graduate students in this field. A successful student in KR needs to deeply develop both the formal and mathematical underpinnings of multiple KR formalisms, as well as needs to address software engineering issues such as scalability. It is therefore of great importance that graduate students have the opportunity (a) to discuss ideas, trends, and technical aspects with key researchers in the area, (b) to start developing their professional contacts, and (c) to extend their knowledge of the state of the art. The primary and most effective way to do this is to participate in key scientific conferences and interact with other researchers working in the field. This is typically done as part of special events and activities in the context of an international conference.

In this proposal, we request support for US students to enable them to attend the Doctoral Consortium of one of the key conferences in the area, the 2014 Principles of Knowledge Representation and Reasoning conference. In the following, we describe further background of the conference, student selection, activities at the conference that further the educational goals that we described, and the actions we have implemented this year to attract students from groups that are normally underrepresented in the conference and in the field of KR.

3 The KR Conference Series and KR 2014

The Principles of Knowledge Representation and Reasoning Conference series (KR) has a long tradition: it was established in 1999 by key researchers in the area, because they realized a need for a focused conference on the topic, in order to develop and drive the research community and to increase outreach to application areas.

KR conference series is supported by KR Inc., a Scientific Foundation incorporated in the state of Massachusetts of the United States of America concerned with fostering research and communication on knowledge representation and reasoning. Its primary activities, other than the organization of the KR conferences, are (i) cooperating with workshops on related topics, and (ii) maintaining informational materials on the World Wide Web, and (iii) maintaining KR-related mailing lists.

The operating structure of KR Inc. consists of the Corporate Officers, the Board of Directors, and the Steering Committee, the distinction between these groups is a legal requirement. The positions are held by some of the most prominent and active researchers in the KR area:

- Gerhard Brewka, University of Leipzig, Germany (President)
- Peter Patel-Schneider, Nuance Communications, US (Clerk and Treasurer)
- Anthony G. Cohn, University of Leeds, UK (Board of Directors)

- Patrick Doherty, Linkping University, Sweden (Board of Directors)
- Christopher A. Welty, IBM Watson Research Center, US (Board of Directors)
- Mary-Anne Williams, University of Technology, Sydney, Australia (Board of Directors)
- Chitta Baral, Arizona State University, US (Steering Committee)
- Giuseppe De Giacomo, Sapienza Università di Roma, Italy (Steering Committee)
- Thomas Eiter, Vienna University of Technology, Austria (Steering Committee)
- Esra Erdem, Sabanci University, Turkey (Steering Committee)
- Michael Fink, Vienna University of Technology, Austria (Steering Committee)
- George Gottlob, Oxford University, UK (Steering Committee)
- Tony Hunter, University College London, UK (Steering Committee)
- Ian Horrocks, University of Oxford, UK (Steering Committee)
- Shelia McIlraith, University of Toronto, Canada (Steering Committee)
- Mirek Truszczynski, University of Kentucky, US (Steering Committee)
- Frank Wolter, University of Liverpool, UK (Steering Committee)
- Stefan Woltran, Vienna University of Technology, Austria (Steering Committee)

For further information about KR Inc., and about past conference events, we point to the following website: `http://www.kr.org`.

Pursuing the idea of creating a hub for KR research, some important events for the community, namely the International Workshop on Non-Monotonic Reasoning (NMR) and the Description Logics Workshop (DL), are often co-located with KR, and NMR and DL representatives are in the KR Steering Committee. Doctoral Consortiums have a long tradition in KR conferences, and has been always a very successful experience, fostering the participation of doctoral students, exposing them to disciplines related to KR, and putting them in direct contact with world-class researchers in the field. On the scientific side, the conference maintains a very high standard with full paper acceptance rate consistently at about 25-30%. Proceedings are published by the AAAI Press, and Artificial Intelligence journal (AIJ) fast tracks the publication of the results from the best papers submitted to the conference.

The 14th International Conference on Principles of Knowledge Representation and Reasoning, KR2014[1], will take place during July 20-24, 2014, in Vienna, Austria, and is part of the Vienna Summer of Logic 2014 (`http://vsl2014.at/`), which is an umbrella for a suite of conferences that will take place in Vienna from July 9-24, 2014. In particular, KR2014 will be co-located with DL 2014, NMR 2014, FLoC 2014 and Logic Colloquium 2014.

The various Chairs of the KR 2014 conferences are:

- General Chair: Thomas Eiter, Vienna University of Technology, Austria

[1] `http://www.kr.org/KR2014//`.

- Program Co-Chairs: Chitta Baral, Arizona State University, US, and Giuseppe De Giacomo, Sapienza Università di Roma, Italy
- Doctoral Consortium Chairs: Birte Glimm, University of Ulm, Germany, and Adrian Pierce, University of Melbourne, Australia
- Local Organization Chairs: Michael Fink and Stefan Woltran, Vienna University of Technology, Austria
- Sponsorship Chair: Marco Maratea, Università di Genova, Italy

4 Doctoral Consortium and Student Events at at KR 2014

In order to help the career of students pursuing a PhD in the area of knowledge representation and reasoning the KR conferences provide a number of events for the participants of the Doctoral Consortium (DC). The aims of the DC are:

- to provide a forum for students to present their current research, and receive feedback from other students and senior researchers;
- to promote contacts among PhD students working in similar areas;
- to support students with information and advice on academic, research and industrial careers.

The Doctoral Consortium is primarily intended for students who have a specific research proposal and some preliminary results, but who have sufficient time prior to completing their dissertation to benefit from the consortium experience. Nevertheless, submissions are encouraged from PhD students at any level and from any topic area within Knowledge Representation and Reasoning.

4.1 Previous DCs at KR

The biannual KR conference series includes a Doctoral Consortium for each conference since 2004. Traditionally, the DC is organized as part of the main conference, usually in the form of a poster session. In previous years additional events have been added such as the assignment of mentors, who meet with their mentees during a mentoring lunch, where the DC participants meet with senior researchers (from both academia and industry) who can give advice on possible career paths after completion of the PhD.

From the 55 student participants of KR2012, 22 students applied and were accepted for participation in the DC. Earlier conferences saw similar DC participation numbers, although in some years a selection had to be made to keep the number of accepted participants to around 20, e.g., in 2004 more than 30 students applied.

A number of student grants is usually awarded among the DC participants. In KR2012, however, no grants were available to US students, which resulted in a low participation rate from the US students in the DC (4 out of 22 students, whereas 15 students from the EU participated).

4.2 Planned evens at DC in KR2014

In order to apply for the DC, students are asked to submit a four-page thesis summary, which provides a description of the research problem addressed, their motivation for addressing the problem, the proposed plan of research, the progress to date and an overview of related work. The applicants are further asked to provide a curriculum vitae and a letter of recommendation from the thesis advisor.

Each student will be assigned a mentor selected from prominent researchers who are attending the conference; thus this will not incur additional costs. Students are encouraged to suggest mentors that are close to their research area during the application stage and we will try to follow the students' wishes where possible. We further encourage students to specify three to five questions in their DC application that they would like to ask their mentor. These questions are forwarded to the chosen mentor (together with the other submitted documents) so as to provide a good starting point for initiating the discussion between a mentor and a mentee.

Drawing from the experience of the DC at KR2012, we will organize the following events for students participating in the DC.

The poster presentation session will give the students the opportunity to present their dissertation plan, including their already established results as well as their work plan for completion of the thesis. The poster will be accompanied by a written version of the dissertation plan, which will be submitted and reviewed before the conference.

The industry lunch will consist of a lunch break where a senior researcher from industry will share a lunch table with 4-5 students. The researcher will be charged with initiating and driving a discussion on general topics concerning research, career, and Knowledge Representation and Reasoning as a discipline. She will also be available to answer students' questions. Questions will be collected beforehand and this will make it possible to assign the right industry member to the right group of students, and will facilitate lively and interesting discussions. The previous DC shows that selecting the right industry members is crucial, but overall the event was rated as success by students as well as the industry member and the event can serve as a good opportunity for follow-up employment after completion of the PhD.

The mentoring lunch will consist of a lunch break where students sit together with their mentors to get detailed feedback on the submitted research proposal and to discuss the further direction of their PhD research with experienced researchers from the area.

The spotlight presentations session will give DC participants the chance to present their research to the general conference audience in short talks. The talk will not only serve as a teaser for the students' posters, but will also allow them to gain experience in speaking to a large audience.

Announcements of the sponsorships will be made through multiple channels, primarily through the conference website and as part of the call for participation. We will further approach researchers at US universities directly, who work in related areas, but who might not normally fund their students' travel to the KR conference series.

4.3 Student Selection

The goal of the student selection process detailed below is to ensure that the selected students will draw the most benefit from the sponsorship. A single type of sponsorship will be available, which will guarantee adequate coverage of related expenses.

Sponsorship will be in the amount of $1,500 per student since previous experience of the conference organizers shows that only a reasonable level of support will help students to attend, who otherwise would not be able to participate. The grant can be used to cover travel and other expenses for attending KR2014, although students may also seek additional funding from other sources. There will be 10 such student grants available.

All students at US universities are eligible to apply for the sponsorships. Among the applicants, students will be selected by a committee consisting of the DC chairs, the PC Chairs (which includes the PI), and the general chair of KR2014. In their decisions, the committee members will adhere to the following preferences for selection, and disagreements will be resolved by majority vote, with the principal PI's vote as tiebreaker.

1. Students who have submitted a dissertation plan for review, and the reviews found the dissertation plan to be of high quality and on an important topic. These students will present a poster and a spotlight talk based on their dissertation plan.

2. Students who are first authors of research papers at the conference, and who provide convincing evidence that they would not be able to attend all or part of the event without a sponsorship. These students will be given an option to also present a dissertation plan poster.

3. Students who are co-authors of research papers at the conference, and who provide convincing evidence that they would not be able to attend all or part of the event without sponsorship. These students will be given an option to also present a dissertation plan poster.

4. Students who have submitted a dissertation plan for review, but the reviews found the dissertation plan of lesser quality. These students will present a poster and a spotlight talk based on their dissertation plan.

5. All other students.

We will also give preference to students whose advisors are not part of the KR community, even if they rank lower in the preference list above.

Secondary criteria are to be used as tiebreakers at the discretion of the selection committee as follows: students belonging to an underrepresented group, students presenting evidence of financial hardship, students in early stages of their PhD studies, quality of the dissertation plan as assessed by the reviews, quality of the (co-)authored KR2014 research paper as assessed by the reviews. In order to apply these criteria in the evaluation process, dates of submission and notifications for the KR2014 DC and for the grant will been aligned accordingly.

5 Other support opportunities

The NSF support will help us in attracting additional funding for student support. In particular, we will pursue the following options:

1. Contacting both past KR conference sponsors and new potential partners: Sponsors include, e.g., publishing houses which have sponsored KR in the past, such as Elsevier, or new candidate sponsors such as the Association for Logic Programming .
2. Offering the opportunity to the best sponsors to have reduced-cost registration fees, to be used preferably by students.
3. Approaching local sponsors, asking explicitly to further support student participation, including the following
   - Kurt Godel Society, `http://kgs.logic.at/`
   - Siemens AG's Corporate Technology Research, `http://www.siemens.com/innovation/en/`
   - Vienna Center for Logic and Algorithms, `http://www.vcla.at/`
   - Wolfgang Pauli Institute, `http://www.wpi.ac.at/`
4. Submitting a grant proposal to the European Space Agency (ESA). ESA runs a program to support EU student participation to scientific conferences, that can complement the NSF funds devoted to US students.
5. Approaching the organizers and chairs of co-located events to see whether there is the chance to support our sponsored students, e.g. by a reduced or waived conference fees, so that the students can also learn about adjacent topics.

Similar actions implemented in past years led to positive results: together with the strong past record in attracting sponsors for the KR conferences in general, and PI and Co-PIs in particular, we are confident to attract additional student sponsorships.

6 The Team and Unfunded Collaborations

The project team consists of a US-based researcher very active in running the KR conference series, together with the KR2014 Doctoral Consortium and Sponsorship Chairs.

- Chitta Baral is in the Steering Committee of KR Inc., and he has been an invited speaker at KR2010. He is the Program co-Chair of KR2014. He will administer this year's NSF funding for student attendance at KR2014.
- Birte Glimm is a Doctoral Consortium co-Chair of KR2014. She is in the Program Committee for the same event in 2014 and 2012 and she worked as reviewer for KR2010 and KR2008.
- Marco Maratea is the Sponsorship Chair of KR2014. He was in the Program Committee for the same event in 2012.
- Adrian Pearce is a Doctoral Consortium co-Chair of KR2014. He was in the Program Committee for the same event in 2012.

The PI has a track record in supervising and mentoring students in KR; several of whom are from underrepresented groups. Three of his Ph.D students (Tran Cao Son, Raul Trejo and Graciela Gonzalez) entered academics after their PhD and several others (Luis Tari, Nam Tran, and

Bob Leaman) are pursuing a career in research. He has also mentored students at the undergraduate and Masters level (Alfredo Gabaldon, and Anthony Gitter) who have continued on to PhD and research. Two of the students he mentored and helped in the proposal writing (Karen Chancellor and Anthony Gitter) were selected for NSF graduate fellowship. He continues to mentor students at all levels, and most recently his undergraduate student Amy Baldwin has been selected for the Google Anita Borg Memorial Scholarship.

Co-PI Birte Glimm currently supervises four doctoral students and the more advanced students have already published in international conferences and journals (e.g., [24, 23, 35, 25] with first author the doctoral student). She is involved in undergraduate as well as in graduate teaching with consistently excellent teaching evaluations. She further introduces students to KR topics in summer schools, e.g., Reasoning Web Summer School 2011, Galway, Ireland or Knowledge Engineering and Semantic Web Summer School 2013, St. Petersburg, Russia. Birte Glimm has also experience as a mentor of the ESWC 2011 PhD Symposium and the German Conference on Artificial Intelligence 2012.

Co-PI Marco Maratea has a track record in tutoring for the STAR-Lab at the University of Genova and supporting and mentoring undergraduate, both in conducting research and through a special Tutoring program implemented in his department, and graduate students. Most of his undergraduate students co-authored a research paper presenting the results of their thesis in international workshops and conferences, and a graduate student he co-advised published 8 papers in international workshops, conferences and journals. E.g., [31, 32, 33, 10, 28] are publications where the primary author is either an undergraduate, Master or PhD student.

Co-PI Adrian Pearce has had experience at the University of Melbourne supervising ten PhDs to completion within the Intelligent Agent Laboratory, 'agentlab'. He has had prior experience contributing to Doctoral Consortia, having Co-Chaired the Autonomous Agents and Multi-Agent Systems (AAMAS) Doctoral Consortium in 2011. He has assisted the candidates he has advised, from the perspective of helping them get papers into international venues, such as KR (e.g. [20]) and IJCAI (e.g. [5]) and journals such as Artificial Intelligence (e.g. [21]); for tackling interesting research topics based on real-world problems; and helping them launch their careers into Academia and industry.

Further unfunded collaborators are the other chairs of KR2014, as listed in Section 3.

7 Dissemination Plan

One of our goals with respect to the requested NSF funds is to attract students who are not part of the traditional groups already involved in KR. In order to implement this, we will do the following.

First, we will state in the calls for participation that we expect to be able to help some of the US students to attend the conference with travel expenses.

Then, the PI and co-PIs will contact researchers that work in areas of interest to KR, but are not currently that involved in KR, to encourage their students to apply for funding. Candidate names include: Prof. Dr. Pascal Hitzler, Wright State University, US; Victor W. Marek, University of Kentucky, US; Jeffrey B. Remmel, University of California San Diego, US. These are well-know

researchers in the related fields of rule languages, propositional satisfiability, constraint programming, hardware verification, representation and complexity theory.

8 Results from Prior NSF Support

The PI, Chitta Baral has been funded by NSF on several projects. Following are the results corresponding to two of the recent ones.

CISE 0412000 (8/1/04-7/31/10): Knowledge representation, reasoning and declarative problem solving in the cellular domain. PI Baral: This project was about using progress in knowledge representation and reasoning to model cell behavior and develop methods to predict the impact of perturbations on the cell, explain observations about the cell behavior, design drug therapies to make the cells behave in particular ways, and generate hypotheses for experimental verification, when the existing knowledge about a cell network can not explain the observed behaviors. In this regard we made significant progress. We started with a paper in ISMB'05 [3] about the prediction, planning and explanation and another [43] in ECCB'05 about hypothesis generation. To develop the systems we had to expand existing knowledge representation languages in AI. This led to the papers [41] and [42] in KR'04 and AAAI'05 respectively. While working on this we realized the importance of developing methods to learn about cell behavior, leading to the paper [44] in AIME'05. We also realized the importance of obtaining cell behavior knowledge from existing literature and this led to the initial papers in PSB'05 [38], in BioLink'05 [4], and in DILS'05 [12]. A collaboration with Glasgow lead to the papers [34] and [42]. During the later years of the project we focused on biological knowledge extraction [12, 11] and reasoning with those extracted facts. This led to publications on protein-protein interaction extraction (in IEEE/ACM Transactions on Computational Biology) [13], on casting information extraction as database querying (in IEEE TKDE and ICDE-demo respectively) [39, 40] , on pathway construction (in PSB 2010) [37] and on inferring drug-drug interactions (in ECCB2010/Bioinformatics) [36]. Thus, we not only made very good progress on this NSF funded project, but it has also positioned us to attack the broader issues of obtaining the knowledge (from text processing, from data mining, and from collaborative curation etc.) that is needed to perform the reasoning. A supplement to this grant helped initiate Dr. Gonzalez to bioinformatics and since then she has published several relevant articles [14, 12, 27]. Three PhDs were completed. Nam Tran did his PhD on the exact topic of the proposal and is a researcher at UCLA Medical School. Xin Zhang did her PhD on learning about cell behavior. Luis Tari did his PhD on extracting biological knowledge from text and after a stint as a post-doctoral researcher at F-Hoffman-La Roche is working at GE Research.

OCI 0950440 0215 (10/1/09-8/31/12): EAGER - Enabling Collaboration in the Creation of Scientific Databases from the Published Literature. PI Baral: As part of this project a system was developed that will be used to update the collaborative database CBioC. The publications supported by this grant are on protein-protein interaction extraction (in IEEE/ACM Transactions on Computational Biology), [13, 39, 40] on casting information extraction as database querying (in IEEE TKDE and ICDE-demo respectively), [37] on pathway construction (in PSB 2010) and [36] on drug-drug interactions (in ECCB2010/Bioinformatics).

Co-PI Marco Maratea, not affiliated with a U.S. organization, has received NSF funding as a Co-PI last year through award 1344437 *Student Travel Fellowships: 2013 Web Reasoning and Rule Systems Conference*. The project started September 1, 2013 and expires August 31, 2014,

for a total funding of $9,900 ($9,000 plus a 10% administrative overhead). The project aimed at supporting promising U.S. students for attending the 7th International Conference on Web Reasoning and Rule Systems (RR2013)[2] and the 9th Reasoning Web Summer School,[3] both held in Mannheim, Germany, 27 July - 2 August 2013.

As a result of this project, 6 students were granted to participate in the conference: without these grants, they could not have attended the event. Most of these students were involved in a number of initiatives. The first was a *mentoring lunch* where a senior researcher shared a lunch table with 4-5 students. In this initiative, the researchers were in charge of initiating and driving a discussion on both general and specific topics concerning research, career, and Web Reasoning as a discipline. Collecting few core questions from students beforehand helped setting up the groups and fostering lively discussions. A second initiative was the *poster presentation session*, accompanied by a written research summary distributed at the conference and preceded by a spotlight presentations session where poster presenters gave 5-minute teaser talks as advertisement for their posters. This resulted in a very well attended and fruitful poster session.

Co-PIs Birte Glimm and Adrian Pierce are not affiliated with a U.S. organization, and have not received NSF funding so far.

[2] `http://rr2013.uni-mannheim.de/`.

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[28] L. Maggi, M. Maratea, S. Sacone, and S. Siri. Computational analysis of freeway traffic control based on a linearized prediction model. In *Accepted to the 52th IEEE Conference on Decision and Control (CDC 2013)*, 2013.

[29] M. Marchiori. Introduction to the special issue on logic programming and the web. *TPLP*, 8(3):247–248, 2008.

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[31] E. D. Rosa, E. Giunchiglia, and M. Maratea. Computing all optimal solutions in satisfiability problems with preferences. In P. J. Stuckey, editor, *CP*, volume 5202 of *Lecture Notes in Computer Science*, pages 603–607. Springer, 2008.

[32] E. D. Rosa, E. Giunchiglia, and M. Maratea. A new approach for solving satisfiability problems with qualitative preferences. In M. Ghallab, C. D. Spyropoulos, N. Fakotakis, and N. M. Avouris, editors, *ECAI*, volume 178 of *Frontiers in Artificial Intelligence and Applications*, pages 510–514. IOS Press, 2008.

[33] E. D. Rosa, E. Giunchiglia, and M. Maratea. Solving satisfiability problems with preferences. *Constraints*, 15(4):485–515, 2010.

[34] C. Shankland, N. Tran, C. Baral, and W. Kolch. Reasoning about the erk signal transduction pathway using biosignet-rr. In *Proc of Computational Methods in Systems Biology (CMSB'05)*, 2005.

[35] A. Steigmiller, T. Liebig, and B. Glimm. Extended caching, backjumping and merging for expressive description logics. In *Proceedings of the 6th International Joint Conference on Automated Reasoning (IJCAR 2012)*, volume 7364 of *Lecture Notes in Computer Science*, pages 514–529. Springer-Verlag, 2012.

[36] L. Tari, S. Anwar, S. Liang, J. Cai, and C. Baral. Discovering drug interactions: a text mining and reasoning approach based on properties of drug metabolism. *Bioinformatics*, 2010.

[37] L. Tari, S. Anwar, S. Liang, J. Hakenberg, and C. Baral. Synthesis of pharmacokinetic pathways through knowledge acquisition and automated reasoning. In *Pacific Symposium on Biocomputing*, volume 15, pages 465–476, 2010.

[38] L. Tari, C. Baral, and P. Dasgupta. Understanding the global properties of functionally related gene networks using the gene ontology. In *Pac Symp Biocomput (PSB'05)*, 2005.

[39] L. Tari, P. Tu, J. Hakenberg, Y. Chen, T. Son, G. Gonzalez, and C. Baral. Parse tree database for information extraction. *IEEE Transactions on Knowledge and Data Engineering*, 2010.

[40] L. Tari, P. H. Tu, J. Hakenberg, Y. Chen, T. C. Son, G. Gonzalez, and C. Baral. GenerIE: Information extraction using database queries. In *ICDE*, pages 1121–1124, 2010.

[41] N. Tran and C. Baral. Reasoning about triggered actions in ansprolog and its application to molecular interactions in cells. In *KR'2004*, pages 54–564, 2004.

[42] N. Tran, C. Baral, and C. Shankland. Issues in reasoning about interaction networks in cells: Necessity of event ordering knowledge. In *AAAI*, pages 676–681, 2005.

[43] N. Tran, C. Baral, and e. a. V. J. Nagaraj. Knowledge-based framework for hypothesis formation in biochemical networks. *Bioinformatics*, 21, suppl 2:ii213–219, 2005.

[44] X. Zhang, C. Baral, and S. Kim. An algorithm to learn causal connection between genes from steady state data: simulation and its application to melanoma dataset. In *Proc Conf on Artificial Intelligence in Medicine (AIME 05)*, 2005.

Biographical sketch: Chitta Baral

Professional Preparation

B.Tech in Computer Science and Engineering, IIT Kharagpur, India, 1987.
M.S in Computer Science, University of Maryland, College Park, 1990.
Doctor of Philosophy, Computer Science, University of Maryland, College Park, 1991.

Appointments

Professor: (Aug 2002 - present) Department of Computer Sc. and Engg., Arizona State University.
Chair: (March 2008 - May 2009) Department of Computer Science & Engineering, Arizona State University.
Associate Professor: (Aug 1999 – Aug 2002) Arizona State University.
Associate Professor: (Sep 1996 - Aug 1999) University of Texas at El Paso.
Assistant Professor: (Sep 1991 - Aug 1996) Dept. of Computer Sc., Univ. of Texas at El Paso.

Products

[1] C. Baral. Knowledge representation, reasoning and declarative problem solving. Cambridge University Press, 2003, ISBN 0521818028. *[Topics: Rules, Answer Set Programming (ASP), Actions, Agents]*

[2] Chitta Baral, Juraj Dzifcak, Marcos Gonzalez and Jiayu Zhou. Using Inverse Lambda and Generalization to Translate English to Formal Languages. Proceedings of International Conference on Computational Semantics (IWCS) 2011, Oxford. *[Topics: ASP, Natural Language Understanding]*

[3] Chitta Baral, Gregory Gelfond, Tran Cao Son, Enrico Pontelli. Using answer set programming to model multi-agent scenarios involving agents' knowledge about other's knowledge. AAMAS 2010: 259-266 *[Topics: ASP, Multi-agent communication and reasoning]*

[4] Juraj Dzifcak, Matthias Scheutz, Chitta Baral, Paul W. Schermerhorn. What to do and how to do it: Translating natural language directives into temporal and dynamic logic representation for goal management and action execution. International Conference in Robotics and Automation (ICRA) 2009: 4163-4168 *[Topics: Temporal Logics, Dynamic Logics, Human Robot Interaction (HRI), NLU]*

[5] Chitta Baral, Thomas Eiter, Marcus Bjareland, Mutsumi Nakamura. Maintenance goals of agents in a dynamic environment: Formulation and policy construction. Artificial Intelligence 172(12-13): 1429-1469 (2008) *[Topics: Robot interaction language, Goal Specification, Agent control]*

Other Significant Products

[1] Chitta Baral, Juraj Dzifcak, Tran Cao Son. Using Answer Set Programming and Lambda Calculus to Characterize Natural Language Sentences with Normatives and Exceptions. AAAI 2008: 818-823 *[Topics: ASP, Natural Language Understanding]*

[2] Chitta Baral, Jicheng Zhao. Non-monotonic Temporal Logics that Facilitate Elaboration Tolerant Revision of Goals. AAAI 2008: 406-411 *[Topics: Robot interaction language, Goal Specification, Goal updating]*

[3] Chitta Baral and Jicheng Zhao. Goal specification, non-determinism and quantifying over policies. In Proceedings of AAAI'06, pages 231-237. *[Topics: Robot interaction language, Goal Specification]*

[4] Tran Cao Son, Chitta Baral, Sheila McIlraith, and Nam Tran. Planning with domain-dependent knowledge of different kinds – an answer set programming approach. ACM Transactions on Computational Logic. Volume 7, Number 4 (October 2006), pages 1-70. *[Topics: KR in planning, ASP]*

[5] C. Baral, L. Floriano, A. Hardesty, D. Morales, M. Nogueira and T. Son. From theory to practice: The UTEP robot in AAAI 96 and AAAI 97 robot contests. In *proceedings of the second international conference on autonomous agents* (Agents 98), 32-38. *[Topics: Robot control, Mobile robots]*

Synergistic Activities

• Invited speaker at AAAI 2005, ICLP 2007, KR 2010 and LPNMR 2011 conferences.

• Area editor: ACM Transactions on Computational Logic; Editorial advisor: Theory and practice of logic programming. Associate Editor of Journal of AI Research (2007-2010). Editorial board member of Advances in Cognitive Systems. Refereed articles for AI Journal, Journal of AI Research, Journal of Automated Reasoning, Journal of Logic Programming, Journal of Logic and Computation, Annals of Math and AI, Journal of Experimental and Theoretical AI, Journal of Intelligent Information Systems, ICLP90, VLDB90, NACLP90, DOOD91, AAAI93, IJCAI93, ICLP93, LPNMR93, ILPS94, ISMIS94, ICLP95, LPNMR95, LPNMR 99, ILPS97, JICSLP98, and most AAAIs, IJCAIs and KRs since 1995.

• Developed and taught courses titled "Computational Pharmacology", "Natural Language Processing", "Autonomous Agents" and "Multi-agent Systems." Developing (taught once) course on "Natural language understanding and QA". Guided teams of students (while at University of Texas at El Paso) to AAAI 96 and 97 robots contests and won the 3rd and 1st position in the office navigation and home vacuuming contests respectively. Also, held robot workshops and robot demonstrations at El Paso area schools.

• Program Chair of KR 2014; Co-program Chair of Workshop on Natural Language Processing and Automated Reasoning (NLPAR 2013); Co-Program Chair of Logic Programming and non-monotonic reasoning conference 2006; Area Chair of KR 2012, Senior program committee of IJCAI 2011, AAAI'2010, AAAI'08 AAAI'04 and AAAI 02, Program Committee of IJCAI 03, AAAI 00, AAAI 99; AAAI 98; AAAI 97; Program Co-Chair, AAAI 97 Workshop on "ROBOTS, SOFTBOTS, IMMOBOTS: Theories of Action, Planning and Control"; Program Chair, AAAI 96 Workshop on "Reasoning about actions, planning algorithms and control architectures : Bridging the gap."; Program Chair of NM'2000 (8th International Workshop on Non-monotonic reasoning); Program Chair of CogRob'2002.

• Advised 18 M.S. students, 9 Ph.D students (three are faculty now and 8 are in academic-or-research careers) and currently advising 6 Ph.D students and 2 masters student. Mentored many undergraduate and minority students, and wrote op-ed articles in local newspaper about information technology.

Collaborators and Co-Editors

Mike Berens, Translational Genomics Research Institute; M. Bjareland, Linkoping University; Thomas Eiter, Vienna University of Technology; M. Gelfond, Texas Tech University; G. Gonzalez, Arizona State University; Ana Joy, Translational Genomics Research Institute; V. Kreinovich, University of Texas at El Paso; Tran Son, New Mexico State University; R. Trejo, Monterey Tech; Y. Zhang, Univ of Western Sydney.

Graduate and Postdoctoral Advisors

Jack Minker, University of Maryland

Ph.D Thesis Advisor and Postgraduate-Scholar Sponsor

Post-docs: Graciela Gonzalez (Associate Professor, ASU BMI), Joerg Hakenberg (Researcher, Mt. Sinai School of Medicine), Lian Yu (Associate Professor, Peking University), Tu Phan (Microsoft).

Ph.D Students: Graciela Gonzalez, Robert Leaman, Tran Son, Luis Tari, Nam Tran, Raul Trejo, Le-Chi Tuan, Xin Zhang and Jicheng Zhao.

Biographical sketch: Birte Glimm

Professional Preparation

Communication Design, Hamburger Technical Art School, Germany, 1998
BSc. Computer Science, Hamburg University of Applied Sciences, Germany, 2004
Doctor of Philosophy, Computer Science, University of Manchester, UK, 2007

Appointments

Junior professor (tenure track): (Jul 2011 – present) Institute of AI, University of Ulm, Germany
Research Assistant (Aug 2008 – Jun 2011) Computing Laboratory, University of Oxford, UK
Senior-Software-Engineer (Feb 2008 – Aug 2008) sd&m AG, Germany
Research Assistant (Sep 2007 – Jan 2008) Computing Laboratory, University of Oxford, UK
System developer and team leader (Jan 2000 – Aug 2001), Elephant Seven GmbH, Germany
Co-founder JEN.net Internet Services GmbH (Apr 1998 – Dec 1999), Germany

Products

[1] S. Rudolph and B. Glimm. Nominals, inverses, counting, and conjunctive queries or: Why infinity is your friend! *J. of Artificial Intelligence Research (JAIR)*, 39:429–481, 2010.

[2] B. Glimm and S. Rudolph. Status QIO: Conjunctive query entailment is decidable. In *Proc. of the 12th Int. Conf. on the Principles of Knowledge Representation and Reasoning (KR 2010)*, pages 225–235. AAAI Press/The MIT Press, 2010.

[3] B. Glimm, I. Horrocks, and U. Sattler. Unions of conjunctive queries in SHOQ. In *Proc. of the 11th Int. Conf. on the Principles of Knowledge Representation and Reasoning (KR 2008)*, pages 252–262. AAAI Press/The MIT Press, 2008.

[4] B. Glimm, I. Horrocks, C. Lutz, and U. Sattler. Conjunctive query answering for the description logic SHIQ. *J. of Artificial Intelligence Research (JAIR)*, 31:150–197, 2008.

[5] B. Glimm, I. Horrocks, C. Lutz, and U. Sattler. Conjunctive query answering for the description logic SHIQ. In *Proc. of the 20th Int. Joint Conf. on Artificial Intelligence (IJCAI 2007)*, 2007.

Other Significant Products

[1] A. Steigmiller, B. Glimm, and T. Liebig. Nominal Schema Absorption. In *Proc. of the 23rd Int. Joint Conf. on Artificial Intelligence (IJCAI 2013)*, pages 1104–1010. AAAI Press/The MIT Press, 2013.

[2] I. Kollia and B. Glimm. SPARQL query answering over OWL ontologies. *J. of Artificial Intelligence Research (JAIR)*, 48, 2013, in press.

[3] N. Nikitina, S. Rudolph, and B. Glimm. Interactive ontology revision. *J. of Web Semantics: Science, Services and Agents on the World Wide Web*, 12–13:118–130, 2012. Special Issue on Reasoning with Context in the Semantic Web.

[4] B. Glimm, I. Horrocks, B. Motik, R. Shearer, and G. Stoilos. A novel approach to ontology classification. *J. of Web Semantics: Science, Services and Agents on the World Wide Web*, 14:84–101, 2012. Special Issue on Dealing with the Messiness of the Web of Data.

[5] N. Nikitina, S. Rudolph, and B. Glimm. Reasoning-supported interactive revision of knowledge bases. In *Proc. of the 22nd Int. Joint Conf. on Artificial Intelligence (IJCAI 2011)*. AAAI Press/The MIT Press, 2011.

Synergistic Activities

- Invited Talks at KESW 2013; Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; Karlsruhe Institute for Technology, Germany; University of Manchester, UK.
- Developed and taught courses "Semantic Web Foundations", "Algorithms in Knowledge Representation", "Introduction to Computer Science".
- Standardization Work: Editor of the W3C SPARQL 1.1 Entailment Regimes specification; Editor of the W3C OWL 2 Web Ontology Language Conformance specification
- Steering Committee member: *Int. Workshop on Description Logics* 2010–2011 & 2013–2017. Organizing committee member: *Conf. on Principles of Knowledge Representation and Reasoning (KR 2014)*; *Int. Workshop on Description Logics (DL 2013)*; Local Organizer *OWL Reasoner Evaluation Workshop (ORE 2013)*; PC Chair *German Conf. on Artificial Intelligence (KI 2012)*; Satellite Events Chair *Int. Joint Conf. on Automated Reasoning (IJCAR 2012)*; Poster & Demo Chair *Int. Semantic Web Conf. (ISWC 2012)*; Proceedings Chair *Int. Semantic Web Conf. (ISWC 2010)*.
- Memberships: Gesellschaft für Informatik (German Association for Computer Science); Association for Automated Reasoning (AAR)

Collaborators and Co-Editors

Samantha Bail, University of Manchester; Alexey Cheptsov, High-Performance Computing Center Stuttgart; Thomas Eiter, Vienna University of Technology; Rafael S. Gonalves, University of Manchester; Aidan Hogan, National University of Ireland; Ian Horrock, University of Oxford; Ernesto Jimnez-Ruiz, University of Oxford; Yevgeny Kazakov, University of Ulm; Ilianna Kollia, National Technical University of Athens; Markus Krötzsch, Technical University Dresden; Antonio Krüger, German Research Center for Artificial Intelligence; Carsten Lutz, University of Bremen; Nicolas Matentzoglu, University of Manchester; Boris Motik, University of Oxford; Nadeschda Nikitina, University of Oxford; Axel Polleres, Vienna University of Economics & Business; Bijan Parsia, University of Manchester; Sebastian Rudolph, Technical University Dresden; Marvin Schiller, University of Ulm; Paul Schmidt, Saarland University; Giorgos Stamou, National Technical University of Athens; Andreas Steigmiller, University of Ulm; Giorgos Stoilos, National Technical University of Athens; Axel Tenschert, High-Performance Computing Center Stuttgart

Graduate and Postdoctoral Advisor

Prof. Dr. Ian Horrocks (University of Manchester, University of Oxford)
Prof. Dr. Uli Sattler (University of Manchester)

Ph.D. Thesis Advisor and Postgraduate-Scholar Sponsor

Post-docs: Dr. Marvin Schiller (U Ulm), Dr. Denis Ponomaryov (U Ulm)
Ph.D Students: Ilianna Kollia, Andreas Steigmiller, Trung Kien Tran, Klaus Ulmschneider

Marco Maratea

Education

2005 University of Genova, Italy Ph.D.
2001 University of Genova, Italy M.S. Computer Engineering

Employment

2010- – Assistant Professor, Faculty of Engineering/Polytechnic School, University of Genova, Italy
2007-2010 – Post-Doctoral Researcher, Faculty of Engineering, University of Genova, Italy
2005-2006 – Post-Doctoral Researcher, Department of Mathematics, University of Calabria, Italy

Selected Professional Activities

International Workshop chair: *7th Workshop on Answer Set Programming and Other Computing Paradigms (ASPOCP 2014)*; *RCRA 2013 International Workshop on "Experimental Evaluation of Algorithms for solving problems with combinatorial explosion"*, Rome, Italy, 14-15 June 2013.
Organizing committee: *14th International Conference on Principles of Knowledge Representation and Reasoning (KR 2014)*, Vienna, Austria, 20-24 July 2014; *7th International Conference on Web Reasoning and Rule Systems (RR2013), & 9th Reasoning Web Summer School (RW2013)*, Mannheim, Germany, July-August 2013; *6th International Conference on Web Reasoning and Rule Systems (RR2012), & 8th Reasoning Web Summer School (RW2012)*, Vienna, Austria, September 2012.
Program committee membership (recent): *21st European Conference on Artificial Intelligence (ECAI2014)*; *23rd International Conference on Artificial Intelligence (IJCAI2013)*; *26th Conference on Artificial Intelligence (AAAI2012)*; *13th International Conference on Principles of Knowledge Representation and Reasoning (KR2012).*

Recent awards. Best paper award: 10th International Congress of the Italian Association for Artificial Intelligence (AI*IA 2007), Rome, Italy, September 2007.

Publications. Dr. Maratea is author of over 40 refereed publications in international conferences and journals. The following is a list of publications most relevant to the proposed project.

Five most relevant recent publications:

1. M. Maratea, L. Pulina, F. Ricca - Multi-Engine ASP Solving with Policy Adaptation. Journal of Logic and Computation. To appear.
2. M. Maratea, L. Pulina, F. Ricca - A Multi-Engine approach to Answer Set Programming. Journal of Theory and Practice of Logic Programming (TPLP). To appear.
3. A. Armando, E. Giunchiglia, M. Maratea, S.E. Ponta - An Action-based Approach to the Formal Specification and Automated Analysis of Business Processes under Authorization Constraints. Journal of Computer and Systems Sciences, Special issue on Knowledge Representation and Reasoning, Vol. 78(1), pg. 119-141, 2012.
4. E. Di Rosa, E. Giunchiglia, M. Maratea - Solving Satisfiability Problems with Preferences. Constraints: Special issue on Constraint-based approaches to preference modelling and reasoning. Vol. 15(4), pg. 485-515, 2010.
5. M. Maratea, F. Ricca, W. Faber, N. Leone - Look-Back Techniques and Heuristics in DLV: Implementation, Evaluation and Comparison to QBF Solvers. Journal of Algorithms. Vol. 63(1-3), pg. 70-89, 2008.

Five other recent publications:

1. M. Maratea - Planning as Satisfiability with IPC Simple Preferences and Action Costs. AI Communications. Vol 25(4), pg. 343-360, 2012.

2. M. Maratea, L. Pulina - Solving Disjunctive Temporal Problems with Preferences using Maximum Satisfiability. AI Communications. Vol 25(2), pg. 137-156, 2012.

3. M. Maratea, L. Pulina, F. Ricca - The Multi-Engine ASP solver ME-ASP. Proc. of the 13th European Conference on Logics in Artificial Intelligence (JELIA 2012). LNCS 7519, pg. 484-487, 2012.

4. E. Giunchiglia, M. Maratea - Algorithms for Solving Satisfiability Problems with Qualitative Preferences. Correct Reasoning - Essays on Logic-Based AI in Honour of Vladimir Lifschitz. LNCS 7265, pg. 327-344, 2012.

5. W. Faber, N. Leone, M. Maratea, F. Ricca - Look-back Techniques for ASP Programs with Aggregates. Fundamenta Informaticae. Vol. 107(4), pg. 379-413, 2011.

Synergistic Activities (selection)

- Journal Reviewing: ACM Transactions on Information Systems and Technology; Journal of Artificial Intelligence Research; Artificial Intelligence; Neural Processing Letters; Information and Computation Journal; Theory and Practice of Logic Programming Journal; Annals of Mathematics and Artificial Intelligence; Constraints; AI Communications; Information Processing Letters; Journal of Logic and Computation.

- Seminars (by invitation): Department of Computer Science, University of L'Aquila, L'Aquila, Italy. April 2008; Department of Mathematics, University of Calabria, Cosenza. Italy. November 2007; Department of Fisics, Section of "Computer Science", University of Naples "Federico II", Naples, Italy. June 2005; Dagsthul Seminar 05171: Nonmonotonic Reasoning, Answer Set Programming and Constraints, Dagsthul, Germany, EU. April 2005; Combination of Decision Procedures Summer School, SRI International, Menlo Park, CA, US. August 2004; Kestrel Institute, Palo Alto, CA, US. August 2004; SRI International, Menlo Park, CA, US. April 2004.

- Visiting periods: Security&Trust Unit, Bruno Kessler Foundation (FBK), Trento, Italy, EU (Novembre 2011 - December 2011); Nato Undersee Research Centre, LaSpezia, Italy, EU (July 2008 - October 2008); Computer Science Department, Stanford University, CA, US (February 2004 - May 2004); Computer Science Department, University of Texas at Austin, TX, US (January 2003 - April 2003).

- Memberships: Italian Association for Artificial Intelligence (AI*IA); Working group on Knowledge Representation and Automated Reasoning (RCRA); Italian Association for Logic Programming (GULP).

Biographical sketch: Adrian R. Pearce

Professional Preparation

B.Sc (Hons) in Computer Science, The University of Melbourne, Australia, 1991.
Doctor of Philisophy, Computer Science, Curtin University of Technology, Perth, Australia,1997.

Appointments

Associate Professor: (Jan 2012-present) Department of Computing and Info. Sys., University of Melbourne.
Senior Lecturer: (Sep 2004-Dec 2011) Department of Computer Science & Soft. Eng., University of Melbourne.
Lecturer: (Jan 2000-Aug 2004) Department of Computer Science & Soft. Eng., University of Melbourne.
Lecturer: (Jan 1998-Dec 1999) School of Computing, Curtin University of Technology, Perth Australia.

Products

[1] Y-T Kuo, A. Lonie, A. R. Pearce, L. Sonenberg. Mining surprising patterns and their axplanations in clinical data. Applied Artificial Intelligence, Vol. 28, No. 2, pg. 111-138, 2014. *[Topics: Multi-agent Systems, Data Mining]*

[2] R. F. Kelly, A. R. Pearce. Property persistence in the situation calculus. Artificial Intelligence, Vol. 174, pg. 865-888, 2010. *[Topics: Situation calculus, Property persistence]*

[3] G. De Giacomo, Y. Lesperance, A. R. Pearce. Situation Calculus-Based Programs for Representing and Reasoning about Game Structures. International Conference on the Principles of Knowledge Representation and Reasoning (KR), pg. 445-455, 2010 *[Topics: Situation calculus, Multi-agent Systems, Model checking]*

[4] M. Blom, A. R. Pearce. Towards an Argumentative Interpreter for Golog Programs. International Joint Conference on Artificial Intelligence (IJCAI), pg. 690-695, 2009 *[Topics: Argumentation, Situation calculus, Multi-agent Systems, Knowledge Representation]*

[5] R. F. Kelly, A. R. Pearce. Complex Epistemic Modalities in the Situation Calculus. International Conference on Principles of Knowledge Representation and Reasoning (KR), pg. 611-620, 2008 *[Topics: Knowledge Representation, Situation calculus, Epistemic reasoning]*

Other Significant Products

[1] J. Huang, A. R. Pearce. Collaborative inductive logic programming for path planning. International Joint Conference on Artificial Intelligence (IJCAI), pg. 1327-1332, 2007 *[Topics: Situation calculus, Multi-agent Systems]*

[2] M. Papasimeon, A. R. Pearce, S. Goss. The human agent virtual environment. International Conference on Autonomous and Multiagent Systems, pg. 1443-1450, 2007 *[Topics: Multi-agent system, Human-computer interaction (HCI), Simulation]*

[3] J. Huang, A. R. Pearce. Distributed interactive learning in multi-agent systems. National Conference on Artificial Intelligence (AAAI-06), pg. 666-671, 2006 *[Topics: Multi-agent systems, Inductive logic programming, Distributed problem solving]*

[4] S. Soon, A. R. Pearce, M. Noble. Adaptive Teamwork Coordination using Graph Matching over Hierarchical Intentional Structures. International Conference on Autonomous Agents and Multi Agent Systems (AAMAS), pg. 294-301, 2004 *[Topics: Multi-agent system, Coordination]*

[5] T. Juan, A. R. Pearce, L. Sterling. ROADMAP: Extending the Gaia Methodology for Complex Open Systems. International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS), , pg. 3-10, 2002 *[Topics: Multi-agent systems, Agent oriented software engineering]*

Synergistic Activities

• Research Institute Establishment & Leadership:
2010 — to date: Program Manager Surveillance & Autonomy, Defence Science Institute, Australia;
2010 — to date: Director of Education, NICTA Victoria Research Laboratory, Australia;

• Recent Research Grants - Australian Research Council:
Sonenberg, Pearce & Dignum, ARC Discovery (2013-2015) *Foundations of human-agent collaboration: situation-relevant information sharing* $350,000;
Pearce & Stuckey, *Making the Pilbara Blend: agile mine scheduling*, ARC Linkage (2011-2015) $1,36 million (ARC: $600,000; Rio Tinto Iron Ore: $762,732);
Kotagiri, Pearce, Barnes, Liu & Blaire *Concept-based retrieval*, ARC Discovery (2003-2007) $671,330 (ARC Centre for Perceptive and Intell. Machines in Complex Environs;

• Journal Reviewing:
Artificial Intelligence; Journal of Artificial Intelligence Research;
Journal of Autonomous Agents and Multiagent Systems; Journal of Logic and Computation;

• Seminars (by invitation):
Defence Science and Technology Organisation (DSTO), Melbourne, Australia, 2013;
Rio Tinto Iron Ore Pty. Ltd., Australia 2012;
Dipartimento di Ingegneria Informatica, "La Sapienza" University of Rome, Italy. 2009;

• Invited Fellowships:
Erasmus Mundas Visiting Fellowship, Free University of Bozen-Bolzano, Italy. 2014;
Dipartimento di Ingegneria Informatica, "La Sapienza" University of Rome, Italy. 2009;
Max Planck Institute for Medical Research, Germany, 2000

• Memberships: Institute of Electrical and Electronic Engineers (IEEE); IEEE Computer Society; Association for Computing Machinery (ACM); Australian Computer Society (ACS); American Association for Artificial Intelligence (AAAI);

Collaborators and Co-Editors

Giuseppe de Giacomo, La Sapienza University of Rome; Yves Lesperance, University of York;
Peter Stuckey, The University of Melbourne; Liz Sonenberg, The University of Melbourne;

Graduate and Postdoctoral Advisors

Terry Caelli, Curtin University of Technology and Walter Bischof, University of Alberta

Ph.D Thesis Advisor and Postgraduate-Scholar Sponsor

Post-docs: Nir Lipovetzky (Research Fellow, The University of Melbourne), Michelle Blome (Research Fellow, The University of Melbourne), Christina Burt (Research Fellow, The University of Melbourne), Christian Muise (Research Fellow, The University of Melbourne), Paolo Felli (Research Fellow, The University of Melbourne).

Ph.D Students: Chris Ewin, Toby Davies, Justin King

SUMMARY PROPOSAL BUDGET

YEAR 1

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION
Arizona State University

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
Chitta Baral

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. (**0**) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**1**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**0**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**0**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**0**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **15,000**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**10**) TOTAL PARTICIPANT COSTS				**15,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**15,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) **Modified Total Direct Cost (Rate: 54.5000, Base: 0)**					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**15,000**	
K. RESIDUAL FUNDS				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**15,000**	

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME
Chitta Baral

ORG. REP. NAME*
Hayley Bohall

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

 ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

SUMMARY PROPOSAL BUDGET

Cumulative

FOR NSF USE ONLY		
PROPOSAL NO.	DURATION (months) Proposed	Granted
AWARD NO.		

ORGANIZATION
Arizona State University

PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR
Chitta Baral

A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets)	NSF Funded Person-months CAL	ACAD	SUMR	Funds Requested By proposer	Funds granted by NSF (if different)
1.	0.00	0.00	0.00		
2.					
3.					
4.					
5.					
6. ( ) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE)	0.00	0.00	0.00	**0**	
7. (**0**) TOTAL SENIOR PERSONNEL (1 - 6)	0.00	0.00	0.00	**0**	
B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS)					
1. (**0**) POST DOCTORAL SCHOLARS	0.00	0.00	0.00	**0**	
2. (**0**) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.)	0.00	0.00	0.00	**0**	
3. (**0**) GRADUATE STUDENTS				**0**	
4. (**0**) UNDERGRADUATE STUDENTS				**0**	
5. (**0**) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY)				**0**	
6. (**0**) OTHER				**0**	
TOTAL SALARIES AND WAGES (A + B)				**0**	
C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS)				**0**	
TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C)				**0**	
D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING $5,000.)					
TOTAL EQUIPMENT				**0**	
E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS)				**0**	
2. FOREIGN				**0**	
F. PARTICIPANT SUPPORT COSTS					
1. STIPENDS $ **0**					
2. TRAVEL **15,000**					
3. SUBSISTENCE **0**					
4. OTHER **0**					
TOTAL NUMBER OF PARTICIPANTS (**10**) TOTAL PARTICIPANT COSTS				**15,000**	
G. OTHER DIRECT COSTS					
1. MATERIALS AND SUPPLIES				**0**	
2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION				**0**	
3. CONSULTANT SERVICES				**0**	
4. COMPUTER SERVICES				**0**	
5. SUBAWARDS				**0**	
6. OTHER				**0**	
TOTAL OTHER DIRECT COSTS				**0**	
H. TOTAL DIRECT COSTS (A THROUGH G)				**15,000**	
I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE)					
TOTAL INDIRECT COSTS (F&A)				**0**	
J. TOTAL DIRECT AND INDIRECT COSTS (H + I)				**15,000**	
K. RESIDUAL FUNDS				**0**	
L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K)				**15,000**	

M. COST SHARING PROPOSED LEVEL $ **0** AGREED LEVEL IF DIFFERENT $

PI/PD NAME
Chitta Baral

ORG. REP. NAME*
Hayley Bohall

FOR NSF USE ONLY		
INDIRECT COST RATE VERIFICATION		
Date Checked	Date Of Rate Sheet	Initials - ORG

C ***ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET**

Budget Justification

Participant Support Costs
The budget supports 10 students at $1,500 travel each to travel to a conference. The conference details are at http://www.kr.tuwien.ac.at/events/kr2014/. The conference is being held in Vienna this year. $1,500 will not cover the total cost for the student but would be awarded and they will seek funding from their departments to cover the difference.

Facilities and Administration (F&A, Indirect/Overhead) Costs
ASU's indirect costs are calculated on Modified Total Direct Costs (MTDC) using F & A rates approved by the U.S. Department of Health and Human Services. The University's Rate Agreement specifies 54% for FY13/FY14 and 54.5% for FY15 and beyond for costs was established on May 29, 2013. MTDC comprises salaries and wages, fringe benefits, materials and supplies, services, travel, and subawards up to $25,000. Items excluded from F & A calculation include: graduate student tuition remission, participant support, subcontracts over the first $25,000, and capital equipment. Since these funds are all in participant support cost no overhead is included.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Baral, Chitta	Other agencies(including NSF) to which this proposal has been/will be submitted

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Computational Analysis of Gene Expression Pattern Images

Source of Support: HHS-NIH-NHGRI

Total Award Amount: $1,781,427.00 Total Award Period Covered: 7/1/2011 - 6/30/2014

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0.5 Acad: 0 Sumr: 0.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Natural Language Interaction With Systems and Agents: Acquiring Knowledge Understanding Text Reasoning and Responding

Source of Support: DOD-NAVY-ONR

Total Award Amount: $324,763.00 Total Award Period Covered: 1/1/2013 - 12/31/2015

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 1.5

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: DataNet Federation Consortium

Source of Support: UNIV NORTH CAROLINA-CHAPL HILL

Total Award Amount: $32,000.00 Total Award Period Covered: 9/1/2013 - 8/31/2014

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 1

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: RI: Medium: Collaborative Research: Foundations for Single-Agent Planning in Multi-agent Environments

Source of Support: NSF

Total Award Amount: $271,971.00 Total Award Period Covered: 6/1/2014 - 5/31/2017

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 1

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: A Foundational Model for Postdoctoral Programs in Computer Science at Large Universities (Dasgupta)

Source of Support: Computing Research

Total Award Amount: $578,819.00 Total Award Period Covered: 7/1/2014 - 6/30/2017

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 0.5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: CCARE: Colon Cancer Adjuvant Research and Experience - A Critical Decision Support Tool for Stage II Colon Cancer Patients and their Physicians

Source of Support: PCORI

Total Award Amount: $2,092,006.00 Total Award Period Covered: -

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 0.5

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: NRI: Collaborative Research: Incremental Dialogue-Based Problem Solving for Mixed-Initiative Human-Robot Teams

Source of Support: NSF

Total Award Amount: $1,013,205.00 Total Award Period Covered: 9/1/2014 - 8/31/2017

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 1

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Exploiting Knowledge and Reasoning in Automating Building and Analysis of Big Mechanisms

Source of Support: DOD-DARPA

Total Award Amount: $4,097,338.00 Total Award Period Covered: 8/1/2014 - 1/31/2018

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 1.35 Sumr: 0

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Student Travel Grant: 2014 Principle of Knowledge Representation and Reasoning Conference and Doctoral Consortium

(THIS PROPOSAL)

Source of Support: NSF

Total Award Amount: $15,000.00 Total Award Period Covered: 5/1/2014-4/30/2014

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0 Acad: 0 Sumr: 0

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*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding Period.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Birte Glimm

Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Student Travel Grant: 2014 Principle of Knowledge Representation and Reasoning Conference and Doctoral Consortium

Source of Support: NSF

Total Award Amount: $ 15,000 Total Award Period Covered: 05/01/14 - 04/30/15

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.00 Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

 USE ADDITIONAL SHEETS AS NECESSARY

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Marco Maratea	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Metodi innovativi per il supporto alle decisioni riguardanti l'ottimizzazione delle attivit in un terminal container (Innovative methods for decision support of activities in a

Source of Support: Autonomous Region of Sardinia (Italy)

Total Award Amount: $ 159,264 Total Award Period Covered: 04/10/12 - 10/30/14

Location of Project: Sardinia (Italy)

Person-Months Per Year Committed to the Project. Cal: 1.00 Acad: 0.00 Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Rete Integrata Mediterranea e Accesso a dati e prodotti (Data and products access in an integrated net in the Mediterranean sea)

Source of Support: Italian Minister of University and Research

Total Award Amount: $ 247,121 Total Award Period Covered: 10/01/13 - 09/30/16

Location of Project: Liguria region (Italy)

Person-Months Per Year Committed to the Project. Cal: 3.00 Acad: 0.00 Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Student Travel Fellowships: 2013 Web Reasoning amd Rule Systems Conference

Source of Support: NSF

Total Award Amount: $ 9,900 Total Award Period Covered: 09/01/13 - 08/31/14

Location of Project: US

Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.00 Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal.

Investigator: Adrian Pearce	Other agencies (including NSF) to which this proposal has been/will be submitted.

Support: ☐ Current ☒ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Student Travel Grant: 2014 Principles of Knowledge Representation and Reasoning Conference and Doctoral Consortium

Source of Support: NSF

Total Award Amount: $ 15,000 Total Award Period Covered: 05/01/14 - 04/30/15

Location of Project: Arizona State University

Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.00 Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Foundations of human-agent collaboration: situation-relevant information sharing

Source of Support: Australian Research Council- Discovery Project (ARC-DP)

Total Award Amount: $ 321,055 Total Award Period Covered: 01/01/13 - 12/31/15

Location of Project: The University of Melbourne

Person-Months Per Year Committed to the Project. Cal: 0.30 Acad: 0.00 Sumr: 0.00

Support: ☒ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title: Making the Pilbara Blend: agile mine scheduling through contingent planning

Source of Support: Australian Research Council - Linkage Project (ARC-LP)

Total Award Amount: $ 1,250,520 Total Award Period Covered: 01/01/12 - 12/31/14

Location of Project: The University of Melbourne

Person-Months Per Year Committed to the Project. Cal: 0.30 Acad: 0.00 Sumr: 0.00

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Sumr:

Support: ☐ Current ☐ Pending ☐ Submission Planned in Near Future ☐ *Transfer of Support

Project/Proposal Title:

Source of Support:

Total Award Amount: $ Total Award Period Covered:

Location of Project:

Person-Months Per Year Committed to the Project. Cal: Acad: Summ:

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

FACILITIES, EQUIPMENT, AND OTHER RESOURCES AT ASU

ASU is a Research-I university and provides ample technical and logistical support for carrying out research projects.

School of Computing, Informatics and Decision Systems Engineering (SCIDSE)

The school maintains instructional labs with Sun, Silicon Graphics Linux, Windows 2000, UNIX workstations, and Pentium PC's. These labs support the special applications required for CSE courses not available elsewhere on the ASU campus. The school has three labs with equipment and software specifically designed for instruction at the microprocessor level. They support Motorola and Intel processors and VLSI design. The school has research labs with computers ranging from personal computers, to UNIX and graphics workstations, to parallel computers such as an IBM RISC workstation cluster and a Silicon Graphics Power Challenge Supercomputer located in the Computing Commons. All computers in the school are networked, with some of the research and instructional labs using the high-speed 100BASE-T protocol. The school also has an ATM backbone linking several of the research labs. The Fulton School of Engineering provides various servers to support client/server applications and development in SCIDSE. All computers in SCIDSE are connected through networking to ASU Information Technology.

The proposed research will be conducted in ASU School of Computing, Informatics and Decision Systems Engineering (SCIDSE). SCIDSE is part of ASU's Fulton School of Engineering, and is housed in Brickyard, a modern 6-story building in downtown Tempe. The SCIDSE researchers involved in this proposal all have their laboratories with adequate computing equipment in the 5th floor of Brickyard. The researchers will also have access to a robotics lab with 7 NAO Humanoid Robots from Aldebaran, as well as several TurtleBots.

The Fulton School of Engineering

The Fulton School's Engineering Computer Services (ECS) provides significant staff dedicated to supporting research activities within the college. College staff provides support for hardware, systems software, and research computing. The central computers, PCs, and distributed workstations in offices and labs in the Engineering Research Center (ERC), Barry Goldwater Center (GWC), and many adjoining engineering buildings are linked to form the Engineering Network Support System (ENSS). ENSS utilizes the standard TCP/IP protocol on an Ethernet local area network. Faculty and labs connect their PCs directly to ENSS, via Ethernet. Computers accessible via ENSS include over 18 centrally managed computers (e.g., SUN SPARC and INTEL Pentium servers), 13-15 Novell PC LANs, 8-10 Windows NT LANs, hundreds of workstations and thousands of PCs and Macs.

Data Management Plan

The data generated through the work described in this proposal will be the proceedings of the conference and the report on the Doctoral Consortium.

Expected Data Types

The conference proceedings and the report on the Doctoral Consortium will be the primary products from this proposal. AAAI press will publish the conference proceedings. The Doctoral Consortium report will be disseminated via ASU and KR web pages.

Policies for Access and Sharing

Plan for Sharing Software

The Doctoral Consortium report will be disseminated via ASU and KR web pages.

Plan for Internal Sharing of Data and Software

The Doctoral Consortium report will be disseminated via ASU and KR web pages.

Policies and Provisions for Reuse and Redistribution

The institutions and the researchers participating to this project have clear policies to encourage research data to be shared with the general public through Internet access. The public distribution of research results and products will be regulated by the participating institutions, in order to protect and to respect any intellectual property rights. Project investigators will work with institutional administrators and with the institutional legal counsels to address any concerns and ensure that all the regulations are properly followed.
There is no restriction on the data (i.e., research outcomes, papers, software products, multi-agent domains and scenarios) regarding re-use, except for the adopters to cite and reference the original data source. We do not envision the application of any fees or dues to access data.

Terms of use/reuse will include disclaimers of liability in connection with any use or distribution of the research products and results.

Long-term Archival and Preservation

The long-term strategy for maintaining, curating and archiving the products of this research is based on the use of the server located at ASU. The server is backed up on a daily basis, using the existing backup infrastructure provided by ASU. The backups are reviewed every two months to verify integrity. No additional hardware or software are needed to preserve and access the data.

The principal investigator will oversee the management of the data repositories.
The period of data retention will be a minimum of three years after the conclusion of the award, or three years after the public release, whichever is later. If patents are obtained from the research accomplishments achieved in this project, the relevant data will be maintained for the duration of the patent.

Compliance of this plan will be managed by the investigator of this project, and the investigator will be responsible for overall data management.

Ownership, Copyright and Intellectual Property

Our team includes scientists and work with communities that have embraced an open-source approach in the storage and exchange of data, research outcomes and software products. Data becomes a community resource, unrestricted for non-commercial use. The producers of research products and software products retain copyright privileges where applicable and reserve licensing and approval rights for commercial uses of published data. Users of the data reserve rights to their algorithms and analysis techniques.

Responsible data management

All of the investigators are certified in responsible conduct of research and scholarship at their respective institutions (e.g., http://researchintegrity.asu.edu/rcr). All of the data and results generated in the context of this proposal will be further governed by the policies of the three participating institutions.