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Preview of Award 1042341 - Annual Project Report

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Cover

Federal Agency and Organization Element to Which Report is Submitted:	4900
Federal Grant or Other Identifying Number Assigned by Agency:	1042341
Project Title:	BPC-AE: Computing Alliance of Hispanic-Serving Institutions
PD/PI Name:	Ann Q Gates, Principal Investigator Malek Adjouadi, Co-Principal Investigator Mohsen Beheshti, Co-Principal Investigator Ahmed M Mahdy, Co-Principal Investigator Enrico Pontelli, Co-Principal Investigator
Recipient Organization:	University of Texas at El Paso
Project/Grant Period:	09/01/2010 - 08/31/2016
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Submitting Official (if other than PD\PI):	Ann Q Gates Principal Investigator
Submission Date:	08/29/2015
Signature of Submitting Official (signature shall be submitted in accordance with agency specific instructions)	Ann Q Gates

Accomplishments

*** What are the major goals of the project?**

The goals of the projects are listed below:

1. To institute a sustainable infrastructure that supports CAHSI's continued impact.

- 1.1 Establish the cyber-infrastructure (CI) to support collaborations, resource discovery and sharing, professional development, and expanded participation.
- 1.2 Enhance collaborative research and education infrastructure at CAHSI institutions.
- 1.3 Establish a methodology/framework for adoption of CAHSI best practices and their dissemination, including K-12 initiatives.
- 1.4 Align CAHSI goals & contributions to local, state, & national priorities and initiatives.
- 1.5 Align CAHSI educational goals with student skills that industry values.

2. To become recognized as an organization that affects decision-making, policy, & cultural change.

- 2.1 Establish mutually beneficial collaborations, in particular those with advocacy groups.
- 2.2 Involve upper administration at CAHSI institutions in discussions about the value of diverse thought, experiences, and approaches with respect to students, faculty, and research.

3. Incubate the next generation educational tools that prepare students for success in STEM.

- 3.1 Provide a framework to systematically nurture and shepherd the development, evaluation, and dissemination of effective pedagogical interventions aimed at enhancing K-12 students' understanding of STEM-related foundational concepts.

*** What was accomplished under these goals (you must provide information for at least one of the 4 categories below)?**

Major Activities:

CAHSI's initiatives and practices continue to be essential elements for support through practices that actively engage students in learning experiences, prepare them for STEM courses, create leadership roles, and develop skills required for research and cooperative work. CAHSI initiatives include CS0 that targets incoming freshman who have not had much exposure to computing; Peer-Led-Team Learning (PLTL) that provides an active learning experience for students, Affinity Research Group (ARG) that emphasizes the development of student research skills with those required for cooperative work, Mentor-Grad (Fem-Prof) that engages Hispanic (female) undergraduates in experiences and activities that prepare them for success in graduate studies and onto the professoriate, and Fellow-Net that mentors and assists students to submit competitive fellowships and scholarships.

CS0: In the last year, NMSU has solidified the use of the CS Principles curriculum in CS0. The course (CS 111) is now officially part of the CS curriculum at NMSU, and it is used as an official prerequisite of the first course in the major. Students are required to either take CS 111 or pass a placement exam in order to take the first regular CS course. Several students take CS 111 while they complete the math prerequisites necessary to pursue a CS major. The enrollment in CS 111 has grown from 15 students in the first semester to 30 students in Spring 2015. The curriculum has been developed and assessed as one of the national CollegeBoard pilots of CS Principles.

FIU has been offering CS0 every summer since 2008 for high school students to encourage them to pursue their higher education in engineering and computing disciplines. Students who take this course in the summer are given three credits

towards their Bachelor's degree. In the past years, the course was offered as COP 1000 enrolling between 15 and 30 students each summer. COP 1000: Introduction to Computer Programming is a course that uses graphics and animation in a media programming environment to engage the high school students with no programming experience to convey the merits in developing problem solving skills and learning fundamental programming concepts through visualization of different mathematical and computing concepts. In the last two years, the CS0 class was offered instead as EEL 2880: Engineering Software Techniques. By using this approach, we are reaching out to students with the inclination to enter in either of the following disciplines: Electrical Engineering, Computer Engineering and of course Computer Science. This past summer, FIU offered this class as EEL 2880 in order to provide students with an overview of a generalized computing system and be exposed to software development, real-life engineering applications, and computational implications in solving different engineering and computing problems including software development for medical information systems. For this summer, we attracted 19 students including 11 Hispanics, 2 females and one African American. The students did exceptionally well in the class (5 A, 6 A-, 2 B+, 2B, 1C, 1 D and 2 DR (drops)).

UTEP's CS0 course (CS1310 Introduction to Computational Thinking) and CS 1320, Programming for Scientists and Engineers, have been accepted as University Core courses. The courses are two of seven courses that can satisfy the six-hour requirement in the "Institutionally Designated Option" component. The objective of this component is to develop critical thinking skills and academic tools required to be an effective learner. Special emphasis is placed on the use of technology in problem solving, communications, and knowledge acquisition. The CS1310 course has been adapted from the Media Propelled Computational Thinking for Math Classrooms (iMPaCT-Math) program that was developed through the efforts of Dr. Eric Freudenthal, CAHSI Computer Science Faculty. The iMPaCT projects started as an intervention for entering college students and have evolved to a family of interventions integrated within a variety of math, engineering, and computer science classes, initially at the college level, and now in high schools. High school students at ninth grade are being engaged in playful programming activities through their Algebra I courses which reinforce their grasping of essential math concepts and introduces them into programming at the same time.

Since 2007, Texas A&M Corpus Christi (TAMUCC) has offered a CS0 course targeting incoming freshman who do not demonstrate the math maturity to register in the CS1 course. Beginning in 2009, any incoming freshman CS major who does not qualify to register for CS1 is automatically registered in the CS0 course.

ARG: Dr. Nayda Santiago (UPRM) is currently disseminating ARG through an NSF CREST grant with Dr. Agnes Padovani in Nanotechnology Center for Biomedical, Environmental and Sustainability Applications. Her duties include to train grad students in research skills using ARG, to train young faculty in using the ARG model, and to train HS students and science teachers using the ARG model. CAHSI institutions continue to use the model, and the model has been adopted outside of CAHSI institutions.

Dr. Natalia Villanueva was invited to the Training for teachers in IT - elementary, middle and high-school Conference. She used this opportunity to promote UTEP and in particular Cyber-ShARE Center's efforts in educations for teachers in elementary, middle and high school. The ARG model was presented as a way to promote teamwork

in the classroom. The conference was held in Aguascalientes, Mexico. Dr. Villanueva also used the ARG model to provide workshops related to her area of research which is web semantics with various Mexican institutions with the goal to strengthen collaborations.

PLTL: As computer science courses have moved online, it was important for departments to keep the services of PLTL yet redefine its delivery. UHD has taken the lead to develop synchronous, online workshops in which leaders guide student activity through voice and screen visualization while students contribute to the dialogue via audio or chat message. A student describes a balancing act peer leaders must perform where they improvise yet come prepared. This balancing act is heightened when leading workshops online.

NMSU has launched a pilot program (funded by the NMSU President) to apply PLTL to different science disciplines. The program has made available funding for 12 peer-mentors each semester, assigned to undergraduate science classes identified as gateway classes for several majors. CAHSI investigators have assisted in the development and deployment of this program.

Supplemental instruction (SI) activities have been integratl to the intro sequence courses at TAMUCC. SI activities have been offered at the instrucional level at TAMUCC for a variety of discipines through the Programs for Academic Support Office.

Through departmental and college funding, UTEP offers PLTL for all intro CS sections. Peer leaders develop dynamic problem solving activities. Also, peer leaders have been assisting faculty to provide test review sessions to reinforce course material. Peer leaders' close involvement with instructors helps them to prepare and visualize the needs for future PLTL sessions. Peer leaders attend classes to be able to reinforce concepts taught in the course.

FellowNet: CAHSI continues working on critical review of scholarships, internships, and fellowship applications. UTEP's Provost Office and Graduate School have adopted the FellowNet workshop and model and have sponsored the workshop over the last several years. In 2015, UTEP had a record seven UTEP-connected GRFP winners with five honorable mentions across all STEM.

Mentor Grad (FemProf): The FemProf program has been led by UPRM and the University of Houston Downtown (UHD). Drs. Nayda Santiago and Ongard Sirisaengtaksin presented the FemProf program at the 2014 Tapia Conference.

Specific Objectives:

To institute a sustainable infrastructure that supports CAHSI's continued impact.

CAHSI's website has moved to the Drupal content management system and will support the use of semantic web technologies. CAHSI is in the process of transferring and adapting technologies, which have been developed at UTEP through NSF I3 funding, to the CAHSI website to support faculty profiles and communities of practice. A prototype is being refined before being transferred to the CAHSI site.

All CAHSI institutions have documented engagement with peers and leaderships that indicate acknowledgement of how CAHSI aligns with institutional efforts that span departments, colleges, and schools. Concrete evidence of institutional support from horizontal (peers) or vertical (administration/leadership) colleagues was attained from

six institutions during the 2014-2015 school year, a substantial increase from last year's four institutions. At two of these schools, CAHSI leaders are advancing and reaching upper echelons of administration within their institutions. The increased visibility of CAHSI leaders as institutional leaders provides greater recognition of CAHSI's work. In two other instances, CAHSI initiatives have been spread to non-CAHSI departments through institutional funding. CAHSI leaders at those schools are advising and supporting and, in some cases, implementing CAHSI initiatives more widely based on these institutional directives. One school with a recent leadership turnover has made plans to bring an administrator to the CAHSI Summit to increase knowledge of CAHSI on their local campus. Yet another institution is using CAHSI strategies as a mechanism to improve departmental climate, and faculty have explicitly written that intention into departmental accreditation planning documents.

To become recognized as an organization that affects decision-making, policy, & cultural change.

CAHSI was recently asked to provide content on a piece for National Public Radio about Hispanic Serving Institutions, specifically for the CAHSI perspective on important outcomes for the Capitol Forum on Hispanic higher education held in Washington DC in March of 2014. This request positioned CAHSI as a national player in the work of HSIs on the national stage. Another instance of an outside organization acknowledging the importance of CAHSI's work was the publication and presentation in a webinar made by Excelencia in Education entitled "Finding your Workforce: Latinos in STEM" (<http://www.edexcelencia.org/research/workforce/stem>). The publication highlights CAHSI in three ways, through the promotion of some of CAHSI's key practices (peer mentoring, faculty interaction, undergraduate research), through explicit mention of CAHSI as a "What Works" award recipient and description of CAHSI's goals, and through a callout box describing the effectiveness of the computer science transfer policy between El Paso Community College and UTEP. Such instances highlight how CAHSI is viewed as a national advocate for Hispanics in computing.

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To incubate the next generation educational tools that prepare students for success in STEM (K-12 focus).

NMSU is leading the way in defining educational approaches to reach K-12 students, in particular female students. In particular, the Young Women in Computing (YWiC) outreach program has more than doubled the numbers of young women going into computer science at NMSU and serves as a model for adoption by other CAHSI schools. Another effective practice is the Young Women Growing Up Thinking

Computationally (YoGUTC), which is housed in NMSU's Department of Computer Science and provides year-round educational initiatives using hands-on learning experiences in beginning coding and object-oriented programming, while advocating for CS to be taught in more schools. UPRM's Alliance for the Increase Participation of Females in Engineering is another effective model for K-12 outreach, and UHD's **Pre-freshman Enrichment Program (PREP)** is a model for a summer STEM program that provides dual-credit for courses, including an introduction to computer science and computational geoscience course.

The inaugural South Texas Unmanned Aircraft Systems (UAS) Institute was on July 27-31 and was hosted by CAHSI investigator Ahmed Mahdy's iCORE Lab, as well as TAMUCC. The goal was to offer a summer institute that connects South Texas students to UAS technology, capitalizing on the interest surrounding this cutting edge industry and placing South Texas students at the forefront of this field. The week long summer institute gave high school students hands-on experience with UAS equipment and software. The objectives of the South Texas UAS Institute were to offer high school students an introduction to UAS engineering concepts and application, UAS and sensor equipment, UAS software, and operation and control of a UAS and sensor equipment. The curriculum was based on participants building a UAS, then using National Instruments' LabVIEW software to interact with the UAS. The students were guided by the institute Director and institute Staff on how to build the UAS and they used LabVIEW to operate the UAS and sensor equipment. CAHSI students helped to make up the staff during the UAS Summer Institute and helped the students with their projects.

Significant Results:

CAHSI is increasingly serving as a unified voice for Hispanics in computing. Dissemination has shifted to focus on sharing CAHSI's perspective in new venues as CAHSI leadership promotes the initiatives and lessons learned from the CAHSI partnership. Leadership and support of CAHSI in higher education and STEM education organizations is spreading across CAHSI stakeholders. Ten faculty and staff members from seven institutions served as CAHSI delegates to national and regional organizations interested in improving and diversifying the computing workforce, and/or in improving educational opportunities for Hispanic students. CAHSI has continuously scored 3 out of 3 on this metric, having representation changes this year with venues related to broadening participation in STEM (e.g., RESPECT 2015, SACNAS, BRAID, XSEDE), improving higher education locally or regionally (e.g., California Hispanic Serving Institution consortium, University of Puerto Rico's R2Deep school of engineering initiative), policy advocacy (e.g., Excelencia in Education), national initiatives to improve computer science education (Computer Science principles, National Endowment for the Humanities course development), and local research efforts (e.g., CREST interdisciplinary work). Faculty and staff report synergies and new ideas that stem from these collaborations, and described how serving as a delegate to support CAHSI increased awareness of CAHSI beyond the current community and influenced the work of CAHSI as well. CAHSI has been positioned as a national resource on Hispanics in computing in the recent Excelencia in Education report published in June of 2015, and from a request for information from National Public Radio to offer a position on the Capitol Forum on Hispanics in higher education. Such instances highlight how CAHSI is viewed as a national advocate for Hispanics in computing.

Key outcomes or Other achievements: In the 2014-15 academic year, the original seven CAHSI schools provided (assuming a 15 week semester and a 3-hour course session per week):

- 15,795 hours of introductory computing content to 351 students, nearly 2/3 were Hispanic or other underrepresented minority students.
- 14,475 hours of undergraduate-led supplemental instruction through PLTL to 965 students, nearly 2/3 were Hispanic or other underrepresented minorities (assuming a 15 week semester and a 1 hour supplemental PLTL session per week).
- 30,825 hours of coursework using the Affinity Research Group model provided to 685 students; more than 80% were Hispanic or other underrepresented minorities.

The expanded network of CAHSI institutions (Northeastern Illinois University) has also delivered CS education programming during the undergraduate experience.

Northeastern Illinois University (NEIU) provided PLTL and ARG courses, offering:

- 5,535 hours of undergraduate-led supplemental instruction through PLTL to 369 students, nearly 40% were Hispanic or other underrepresented minorities.
- 7,560 hours of coursework using the Affinity Research Group model provided to 168 students, nearly 30% were Hispanic or other underrepresented minorities.

In the past year, CAHSI has continued to produce large numbers of Hispanic baccalaureates in computing. In 2014, CAHSI increased its total number of baccalaureates by 30 students, to 288 graduates from CAHSI departments. The number of women granted BS degrees in CAHSI departments declined from 51 to 31 degree recipients. The number of CAHSI Hispanic BS graduates rose by nearly 25%, or 40 students, to 205 Hispanic degree recipients. CAHSI BS graduation rates have been on an upward trend for the past two years. Nationally, the comparison set of departments from IPEDs graduated 52% of the number of baccalaureates that they graduated in 2002, while CAHSI graduated 76% of its 2002 total. When considering only departments that have existed since 2002 (our baseline comparison year), US mainland schools graduated 643 Hispanic baccalaureates in CS/CE; 139 of those Hispanic graduates were from CAHSI mainland schools. In other words, CAHSI departments graduated 22% of all Hispanic CS/CE baccalaureates in the mainland US in 2013-14.

* What opportunities for training and professional development has the project provided?

K-12: Since 2012, CAHSI started to align K-12 initiatives with other program to focus on increasing the number of new students in the area of Computer Science. NMSU under the direction of Dr. Enrico Pontelli, has taken the lead in the K-12 outreach efforts. The Young Women in Computing (YWiC) outreach program has more than doubled the numbers of young women going into computer science at NMSU. YWiC have served over 330 middle and high school girls during its summer activities, with almost 70% of students entering a STEM major and 100% college matriculation. The in-class and after-school activities of YWiC reached over 9,500 K-12 students, contributing to increasing awareness, engagement, and competency in computing. Young Women Growing Up Thinking Computationally (YoGUTC) is housed in the Department of Computer Science, and provides year-round educational initiatives using hands-on learning experiences in beginning coding and object-oriented programming, while advocating for CS to be taught in more schools. YoGUTC will focus on the underrepresentation of women in computing, especially Hispanic Women.

YO-GUTC expanded its activities; during the academic year we conducted roadshows, community presentations that reached over 1,300 students. YO-GUTC performed two afterschool programming, with 25 participants each, focused on learning Arduino programming and Python. YO-GUTC conducted four summer camps. One camp was exclusively for middle school girls, with 30 participants, focused on SNAP! A second camp was reserved for high school girls (25 girls, Python and Arduino). The third camp focused on energy and smartgrids (high school, 20 participants). The fourth camp was a co-ed high

school camp with emphasis on Apps development (25 participants). The latter camp was matched by a concurrent training camp for high school teachers (8 participants), where teachers explored with the help of CS graduate students the use of Apps development in the teaching of scientific concepts.

Under the AIPFE project (Alliance for the Increase Participation of Females in Engineering), UPRM organized visits to five high schools. Undergraduate students made presentations about the computer engineering and the electrical engineering programs. Over 120 students were impacted. AIPFE also organized an on campus activity in which students from high and middle schools in Puerto Rico were invited to learn about computer engineering, electrical engineering and computer sciences. Fifty two girls from middle and high schools from several towns came to the activity. The activity was organized by a group of 18 undergraduate (very enthusiastic) female students from the electrical and computer engineering programs and the CS program of the Math department. The orientation focused on those three programs. In the morning a power point presentation was provided highlighting the University of Puerto Rico, the College of Engineering and the three programs. Then a short video was presented about the experiences of undergraduate female students in engineering that was produced with funds from the Mini Grant. The video can be viewed it at: <https://www.youtube.com/watch?v=QH6KmcKy8yc>

After the video UPRM presented each of the undergraduate collaborators, highlighting their extracurricular activities using a few slides. Next, they had a session of demos of research and class projects of the featured disciplines. At lunch, each of the undergraduate students sat with a group of participants to engage in conversations about the programs and the experiences of undergraduate students. In the afternoon they participated in two workshops. An orientation session with parents (28 attendees) was also held. A group of students and faculty answered questions from them. A pre survey was provided asking the students about their knowledge of the three programs and a post survey with the same questions and an evaluation of the different elements of the activity.

Houston Pre-freshman Enrichment Program (PREP): UHD is involved in the Houston-PREP program. Houston PREP is an academically intensive, seven week, four-summer investigation-focused program providing state of Texas school credits for high school students with potential to be STEM college majors. In summer 2015, over 300 students participated. All students are exposed to coding through SCRATCH and robotics. Dual Credit classes:

- Introduction to Computer Science (3 credit hours). A group of 45 high school students enrolled and successfully completed the course in summer 2015.
- Explorations in Computational Geoscience (4 credit hours). This interdisciplinary course was developed by CAHSI PI Dr. Shastri and a Geophysics faculty, Dr. Pinelis. The course was co-taught by them covering the geoscience fundamentals by Dr. Pinelis and the computer science fundamentals by Dr. Shastri. Specifically, the course covered the following topics: Learning Visual C# programming language including writing algorithms, developing Graphical User Interfaces (GUI); Understanding geoscience fundamentals including computational problems and solutions in the exploration, production, and petroleum geology; and Developing software plug-ins through Schlumberger's Ocean Software Development Toolkit (SDK) on the company's software development platform, Petrel.

UHD's industry partner, Schlumberger provided financial support for course including curriculum development support for one of the faculty members, teaching assistant support for three UHD students, and logistic support to purchase course textbooks.

The UHD has been collaborating with the Rice University in the NCWIT Aspirations in Computing Houston Affiliate competition that honors young women at the high school level for their computing-related achievements and interests. Over 100 girls applied, among them 45 winners and runner ups were selected.

PLTL: UTEP received NCWIT seed funds to extend PLTL to the El Paso Community College (EPCC), which serves as a feeder for the UTEP program. The goals was to establish early connections with students. The pilot program was held during the Spring 2013, Summer 2014, and Fall 2014 semesters. As part of the PLTL integration, EPCC team leaders attended a peer leader session at UTEP during the semester to deepen their understanding the program and experience the sessions directly.

SACNAS National Conference, October 16-18, 2014, Los Angeles, CA. This year's theme at the SACNAS National Conference was *"Creativity, Vision, & Drive: Toward Full Representation in STEM."* SACANS provides conference activities for students, educators, and researchers in STEM disciplines. The national meeting provides a wide variety of mentoring and training sessions, research presentation opportunities, nationally renowned keynote speakers, over 275 exhibits, networking activities and special events, and cultural performances. SACNAS is also known for having one of the best Graduate school fairs. CAHSI had a SACNAS research agenda and hosted an event titled **"Conversations with Scientists – Computer & Information Sciences"** where students had the opportunity to have small table discussions with various professionals from this field. TAMUCC has a student-run SACNAS Chapter.

At the Annual Science Innovation event AMUCC CAHSI student, Christopher Rios, presented his research titled *"Controlling an Unmanned Aerial Vehicle System using Augmented Reality and Human Computer Interaction (Google Glass)."* Also, all of CAHSI students participated in demos to showcase their research with the iCORE Lab at TAMUCC. The Science event also hosted a panel of professionals from different STEM degrees share their personal journeys.

Student Awards:

- Adrian Ildefonso – URPM, NSF Graduate Research Fellowship
- Adriana Camacho - UTEP, NSF Graduate Research Fellowship
- Kathia Torres – 2014 HENAAC Scholarship sponsored by EMC Corporation
- Paola Gallardo - 2014 SACNAS Student Presentation award
- Numerous student awards to the Grace Hopper Conference

*** How have the results been disseminated to communities of interest?**

In 2014-15, seven accepted or presented works directly related to CAHSI initiatives were reportedly carried out by staff or faculty in CAHSI in multiple venues (Frontiers in Education, NCWIT, PLTL International Society, SACNAS). Works were found in regional, national, and international conferences. Over time, publications related to CAHSI as an organization and its related initiatives include 19 works that appear in the ACM and IEEE digital libraries with over 30 authors representing seven schools, with at least 1,954 downloads. These works represent the efforts of over 30 authors representing seven schools, with at least 1,954 downloads. This dissemination is related to CAHSI as an organization, and does not include technical research efforts that were supported through CAHSI.

Specific presentations by PI Gates include:

- Microsoft Faculty Summit 2015
- July 8, 2015
- A Universally Designed Environment to Advance Hispanics
- XSEDE 15
- July 30, 2015
- Plenary: Building Effective Teams in Extreme Science and Engineering Environments
- BRAID 2015
- July 16, 2015
- Panel: Building Confidence and Community among Students from Underrepresented Groups
- RESPECT 2015
- August 14, 2015
- Panel: BPC Fireside Chat
- NCWIT Summit
- May, 2015
- Poster presentation
- Academic Career Workshop
- May 2, 2015

- ARG Workshop, panel presentations on T&P, and promotion to full professor

*** What do you plan to do during the next reporting period to accomplish the goals?**

CAHSI has requested a one-year extension to continue its work on building infrastructure to support its impact and to support the adoption and dissemination of CAHSI through workshops, presentations, and the CAHSI Summit.

The CAHSI summit will be held in San Juan, Puerto Rico September 10-12, 2015. There are 57 abstracts and 22 papers that have been accepted, all acknowledging the support of NSF. These will be reported in the next annual report to NSF as published articles and abstracts.

Supporting Files

Filename	Description	Uploaded By	Uploaded On
CAHSI Evaluation Report 2015_final .pdf	The evaluation report submitted by Drs. Heather Thiry and Sarah Hug.	Ann Gates	08/24/2015

Products

Books

E. Pontelli, T. Son (2014). *Practical Aspects of Declarative Languages - 17th International Symposium* Springer Verlag. New York. Status = PUBLISHED; Acknowledgment of Federal Support = No ; Peer Reviewed = No

Book Chapters

A. Dal Palu, A. Dovier, A. Formisano, E. Pontelli (2014). Exploring Life through Logic Programming: Answer Set Programming in Bioinformatics. *David Warren's Festschrift* . Status = ACCEPTED; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

H. Thiry and S. Hug (2015). Inclusive computing communities: Lessons learned from the Latina double bind. *Girls and women of color in STEM: Navigating the double bind* B. Polnick, B. Irby, and J. Ballenger. Information Age Publishing Inc.. Charlotte, NC. . Status = AWAITING_PUBLICATION; Acknowledgement of Federal Support = Yes ; Peer Reviewed = Yes

Conference Papers and Presentations

Alajarmeh, N., Pontelli, E. (2014). *A Multi-Layer Universally Designed Workspace for Tracking Students Skills and Mastery Transition in Mathematics Manipulation in Inclusive Education*. Frontiers in Education, IEEE. Madrid, Spain. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Y. Ma, J. Han, and M. Beheshti (2014). *A Smartphone Management Strategy Based on Learning from Behaviors*. International Congress on Engineering and Information. Beijing, China. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Z. Wang, L. Guo and M. Adjouadi (2014). *A biological plausible Generalized Leaky Integrate-and-Fire neuron model*. 36th Annual International Conference of the IEEE, Engineering in Medicine and Biology Society (EMBC). Chicago, Illinois. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

AL-Jarrah, A., Pontelli, E. (2014). *Alice as a Collaborative Virtual Environment*. Frontiers in Education, IEEE. Madrid, Spain. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

M. Goryawala, Q. Zhou, R. Duara, D. Loewenstein, M. Cabrerizo, W. Barker, and M. Adjouadi (2014). *Altered small-world anatomical networks in Apolipoprotein-E4 (ApoE4) carriers using MRI*. Engineering in Medicine and Biology Society (EMBC), 36th Annual International Conference of the IEEE. Chicago, Illinois. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Arraki, K., Blair, K., Burgett, T., Greenling, J., Haebe, J., Peel, A., Szczepanski, V., Pontelli, E. (2014). *An Experiment in Infusing Computational Thinking in K-12 Science Curricula*. Frontiers in Education, IEEE. Madrid, Spain. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

R. Folk, A. Peel, T. Burgett, V. Szczepanski, J. Fulton, E. Pontelli (2015). *Analysis of Pedagogical Techniques to Integrate Computational Thinking into K-12 Curricula*. IEEE Frontiers in Education. . Status = ACCEPTED; Acknowledgement of Federal Support = Yes

L. Galarza, Z. Wang, and M. Adjouadi (2014). *Book Spread Correction Using a Time of Flight Imaging Sensor*. International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV). Las Vegas, Nevada. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

S. Sargolzaei, M. Goryawala, M. Cabrerizo, G. Chen, P. Jayakar, R. Duara, W. Barker, and M. Adjouadi (2014). *Comparative reliability analysis of publicly available software packages for automatic intracranial volume estimation*. Engineering in Medicine and Biology Society (EMBC), 36th Annual International Conference of the IEEE. Chicago, Illinois. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

A. Peel, J. Fulton, E. Pontelli (2015). *DISSECT: An Experiment in Infusing Computational Thinking in a Sixth Grade Classroom*. IEEE Frontiers in Education. . Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Tran Cao Son, Enrico Pontelli, Chitta Baral, Gregory Gelfond (2015). *Exploring the KD45 Property of a Kripke Model After the Execution of an Action Sequence*. 29th Conference on Artificial Intelligence (AAAI). . Status = PUBLISHED; Acknowledgement of Federal Support = Yes

N. Nesiba, T. Staley, E. Pontelli (2015). *Exploring the Relationship Between Computational Thinking and English Literature in K-12 Curricula*. IEEE Frontiers in Education. . Status = ACCEPTED; Acknowledgement of Federal Support = Yes

R. Folk, G. Lee, A. Michalenko, A. Peel, E. Pontelli (2015). *GK-12 DISSECT: Incorporating Computational Thinking with K-12 Science without Computer Access*. IEEE Frontiers in Education. . Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Q. Zhou, M. Goryawala, M. Cabrerizo, W. Barker, D. Loewenstein, R. Duara and M. Adjouadi. (2014). *Multivariate Analysis of structural MRI and PET (FDG and 18F-AV-45) for Alzheimer's disease and its prodromal stages*. Engineering in Medicine and Biology Society (EMBC), 2014 36th Annual International Conference of the IEEE. Chicago, Illinois. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Villanueva-Rosales, N. (2014). *Preparando a los profesionistas del Futuro*. Training for teachers in IT - elementary, middle and high-school. Aguascalientes, Mexico. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

J. Han, Y. Ma (2014). *Software Project Planning Using Agile, Advanced in Intelligent Systems and Computing*. International Conference on Systems Engineering. Las Vegas, USA. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Tiep Le, Tran Cao Son, Enrico Pontelli, William Yeoh (2015). *Solving Distributed Constraint Optimization Problems Using Logic Programming*. 29th Conference on Artificial Intelligence (AAAI). . Status = PUBLISHED; Acknowledgement of Federal Support = Yes

Hug, S., Thiry, H., and A. Gates (2015). *Strategies for Sustaining Change in Engineering Education*. Frontiers in Education. El Paso, TX. Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Gates, A., Casas, C., C. Servin, and M. Slattery (2015). *Using Peer-Led Team Learning to Build University-Community College Relationships*. *Frontiers in Education*. El Paso, TX. Status = ACCEPTED; Acknowledgement of Federal Support = Yes

H. Thiry and S. Hug (2014). *Using educational theory to enhance the cultural competence of program evaluation*. American Evaluation Association annual meeting. Denver, CO. Status = PUBLISHED; Acknowledgement of Federal Support = Yes

N. Nesiba, J. Dana, N. Muhyi, J. Chen, N. Ray, E. Pontelli (2015). *Young Women in Computing: Creating a Successful and Sustainable Pipeline*. *IEEE Frontiers in Education*. . Status = ACCEPTED; Acknowledgement of Federal Support = Yes

Inventions

Journals

A. Motahari and M. Adjouadi (2015). Barcode Modulation Method for Data Transmission in Mobile Devices. *IEEE Transactions on Multimedia*. 17 (1), 118-127. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

A. Salah Eddin, J. Wang, W. Wu, S. Sargolzaei, B. Bjornson, R. Jones, W.D. Gaillard, and M. Adjouadi (2014). The Effects of Pediatric Epilepsy on a Language Connectome. *Human Brain Mapping*. 35 (12), 5996-6010. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Alessandro Dal Palù, Agostino Dovier, Andrea Formisano, Enrico Pontelli (2015). CUD@SAT: SAT solving on GPUs. *J. Exp. Theor. Artif. Intell.* 27 (3), 293. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

B. Tang, J. Han, M. Beheshti, G. Poppe, L. Nguekap, and R. Siddiqui, (2015). Seismic Data Collection with Shakebox and Analysis Using MapReduce. *Journal of Computer and Communications*. 3 94-101. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

B. Tang, J. Han, M. Beheshti, G. Poppe, L. Nguekap, and R. Siddiqui. (2015). Seismic Data Collection with Shakebox and Analysis Using MapReduce. *Journal of Computer Communications*. 3 94-101. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

B. Tang, R. Bagai, and H. Lu (2015). An improved statistical disclosure attack. *International Journal of Granular Computing, Rough Sets and Intelligent Systems*. . Status = ACCEPTED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Cabrerizo, A. Cabrera, J. Perez, J. De la Rúa, N. Rojas, Q. Zhou, A. Pinzon-Ardila, S. Gonzalez-Arias and M. Adjouadi (2014). Induced Effects of Transcranial Magnetic Stimulation on the Autonomic Nervous System and the Cardiac Rhythm. *Scientific World Journal*. 2014 . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1155/2014/349718

Chongbing Liu, Enrico Pontelli (2014). Techniques to enhance efficiency and effectiveness of inductive logic programming systems: the TWEETY approaches. *J. Exp. Theor. Artif. Intell.* 26 (1), 51. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

Ferdinando Fioretto, Agostino Dovier, Enrico Pontelli (2015). Constrained Community-Based Gene Regulatory Network Inference. *ACM Trans. Model. Comput. Simul.* 25 (2), 11. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

M. Goryawala, Q. Zhou, W. Barker, D. A. Loewenstein, R. Duara, and M. Adjouadi (2015). Inclusion of Neuropsychological Scores in Atrophy Models Improves Diagnostic Classification of Alzheimer's Disease and Mild Cognitive Impairment. *Computational Intelligence and Neuroscience*. 2015 . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1155/2015/865265

M. Goryawala, S. Gulec, R. Bhatt, A.J. McGoron, and M. Adjouadi (2014). A Low-Interaction Automatic 3D Liver Segmentation Method Using Computed Tomography for Selective Internal Radiation Therapy. *Biomed Research International*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1155/2014/198015

R. Bagai, B. Tang, A. Samad, and A. Khan (2015). A System-Wide Anonymity Metric with Message Multiplicities. *International Journal of Security and Networks*. 10 20-31. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

S. Sargolzaei , M. Cabrerizo, M. Goryawala, A. Salah Eddin, (2015). Scalp EEG Brain Functional Connectivity Networks in Pediatric Epilepsy. *Computers in Biology and Medicine*. 56 158-166. Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes

S. Sargolzaei, A. Sargolzaei, M. Cabrerizo, M. Goryawala, G. Chen, A. Pinzon-Ardila, S. M. Gonzalez-Arias and M. Adjouadi (2015). Estimating Intracranial Volume (ICV) in brain research: An Evaluation of Methods. *Neuroinformatics*. . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1007/s12021-015-9266-5

S. Sargolzaei, A. Sargolzaei, M. Cabrerizo, M. Goryawala, Q. Zhou, S. Noei, G. Chen, R. Duara, W. Barker and M. Adjouadi (2015). A practical guideline for intracranial volume estimation in patients with Alzheimer's disease. *BMC Bioinformatics*. 16 (7), . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1186/1471-2105-16-S7-S8

S. Sargolzaei, M. Cabrerizo, A. Sargolzaei, S. Noei, H. Rajaei, A. Salah Eddin, A. Pinzon-Ardila, S. M. Gonzalez Arias, P. Jayakar and M. Adjouadi (2015). A probabilistic approach for pediatric epilepsy diagnosis using brain functional connectivity networks. *BMC Bioinformatics*. 16 (7), . Status = PUBLISHED; Acknowledgment of Federal Support = Yes ; Peer Reviewed = Yes ; DOI: 10.1186/1471-2105-16-S7-S9

Licenses

Other Products

Other Publications

Patents

Technologies or Techniques

Thesis/Dissertations

Websites

CRA A. Nico Habermann Award

<https://www.youtube.com/watch?v=FqWH6e-0ZPo>

Video of award with highlights of CAHSI

Computing Alliance of Hispanic-Serving Institutions

<http://cahsi.org>

The website provides information about the alliance, student resources, faculty resources, social science research, and the CAHSI Summit.

Participants/Organizations

Research Experience for Undergraduates (REU) fundingForm of REU funding support: REU
supplement

How many REU applications were received during this reporting period? 5

How many REU applicants were selected and agreed to participate during this reporting period? 5

REU Comments:

What individuals have worked on the project?

Name	Most Senior Project Role	Nearest Person Month Worked
Gates, Ann	PD/PI	2
Adjouadi, Malek	Co PD/PI	1
Beheshti, Mohsen	Co PD/PI	1
Mahdy, Ahmed	Co PD/PI	1
Pontelli, Enrico	Co PD/PI	2
Santiago, Nayda	Co-Investigator	1
Boadi, Antonia	Faculty	1
Cao, Huiping	Faculty	1
Caruso, Korinne	Faculty	1
Ceberio, Martine	Faculty	1
Eric, Freudenthal	Faculty	0
Ersoy, Burak	Faculty	1
Fuentes, Olac	Faculty	1
Gad, Sangeeta	Faculty	1
Hadimlioglu, Ismail	Faculty	1
Han, Jianchao	Faculty	1
Kiekintveld, Chris	Faculty	1

Kowalski, Kazimierz	Faculty	1
Longpre, Luc	Faculty	0
Morales, Lisnel	Faculty	1
Nakamura, Mitsue	Faculty	1
Perera, Graciela	Faculty	1
Rahnemoonfar, Maryam	Faculty	1
Roy, Mary	Faculty	0
Scott, King	Faculty	1
Sharbaf, Mehrdad	Faculty	1
Sperry, Rita	Faculty	1
Villanueva, Natalia	Faculty	1
Villaverde, Karen	Faculty	0
Bao, Wei-Yu	Other Professional	1
Casas, Claudia	Other Professional	12
Escobar, Krystal	Other Professional	6
Galves, Rebecca	Other Professional	4
Mayelin, Felipe	Other Professional	1
Strange, Stephanie	Other Professional	2
Miranda-Tellez, Daniela	Technician	4
Teran Lopez, Christian	Undergraduate Student	6
Hug, Sarah	Consultant	3
Thiry, Heather	Consultant	3

Muhyi, Noor	Research Experience for Undergraduates (REU) Participant	2
Smith, Jeremiah	Research Experience for Undergraduates (REU) Participant	2

Full details of individuals who have worked on the project:

Ann Q Gates

Email: agates@utep.edu

Most Senior Project Role: PD/PI**Nearest Person Month Worked:** 2

Contribution to the Project: Project lead; oversees the operation of CAHSI, implementation of CAHSI initiatives at UTEP, and organization of BOA and All-Hands meetings.

Funding Support: University and CNS-1042341.

International Collaboration: No

International Travel: No

Malek Adjouadi

Email: adjouadi@fiu.edu

Most Senior Project Role: Co PD/PI**Nearest Person Month Worked:** 1

Contribution to the Project: Organize and help recruit students for the CS0 Class which is offered every summer at FIU. Help students who apply for fellowships to NSF and other federal agencies. Help with outreach activities through our engineer and computing fair and other student activities. Introduce undergraduate and high school students to the merits of research through visits to our research centers.

Funding Support: NSF

International Collaboration: No

International Travel: No

Mohsen Beheshti

Email: mbeheshti@csudh.edu

Most Senior Project Role: Co PD/PI**Nearest Person Month Worked:** 1

Contribution to the Project: Member of the Executive Committee; oversees the operations of CAHSI at CSU-DH and California initiatives.

Funding Support: CNS-1042341

International Collaboration: No

International Travel: No

Ahmed M Mahdy**Email:** ahmed.mahdy@tamucc.edu**Most Senior Project Role:** Co PD/PI**Nearest Person Month Worked:** 1**Contribution to the Project:** Senior Personnel; oversees the activities at TAMU-CC.**Funding Support:** CNS-1042341**International Collaboration:** No**International Travel:** No

Enrico Pontelli**Email:** epontell@cs.nmsu.edu**Most Senior Project Role:** Co PD/PI**Nearest Person Month Worked:** 2**Contribution to the Project:** Dr. Pontelli coordinates the CAHSI activities at NMSU. He also participates in the leadership activities of the alliance. He primarily leads the K-12 aspects of the current CAHSI efforts.**Funding Support:** NMSU**International Collaboration:** No**International Travel:** Yes, Italy - 0 years, 0 months, 14 days

Nayda Santiago**Email:** nayda.santiago@ece.uprm.edu**Most Senior Project Role:** Co-Investigator**Nearest Person Month Worked:** 1**Contribution to the Project:** Nayda Santiago (UPRM) co-leads the undergraduate research effort.**Funding Support:** She receives support from BPC (CNS-1042341)**International Collaboration:** No**International Travel:** No

Antonia Boadi**Email:** aboadi@csudh.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Antonia Boadi is a faculty research advisor at CSUDH. Han Jianchao is the PLTL and research faculty advisor at CSUDH.**Funding Support:** She receives support from BPC funds (CNS-1042341)**International Collaboration:** No**International Travel:** No

Huiping Cao**Email:** hcao1@nmsu.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1

Contribution to the Project: Huiping Cao (NMSU) has joined the CAHSI effort by providing her expertise in the area of ontology development. She is supporting the activities aimed at the development of a cyber-infrastructure for CAHSI. She is also supportive of the PLTL efforts at NMSU.

Funding Support: NMSU and NSF CREST**International Collaboration:** No**International Travel:** Yes, China - 0 years, 0 months, 14 days

Korinne Caruso**Email:** korinne.caruso@tamucc.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1

Contribution to the Project: Korinne Caruso is participating in the use of PLTL in intro sequence courses

Funding Support: University**International Collaboration:** No**International Travel:** No

Martine Ceberio**Email:** mceberio@utep.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1

Contribution to the Project: Martine Ceberio participated in peer leading courses at UTEP

Funding Support: University**International Collaboration:** No**International Travel:** No

Freudenthal Eric**Email:** efreudenthal@utep.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 0

Contribution to the Project: Eric Freudenthal oversees the CS-0 effort at UTEP.

Funding Support: University**International Collaboration:** No

International Travel: No

Burak Ersoy

Email: burak.ersoy@tamucc.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Supervises MentorGrad students at Texas A&M University - Corpus Christi.

Funding Support: University

International Collaboration: No

International Travel: No

Olac Fuentes

Email: ofuentes@utep.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Olac Fuentes participated in peer leading courses at UTEP

Funding Support: University

International Collaboration: No

International Travel: No

Sangeeta Gad

Email: gadS@uhd.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Sangeeta Gad assists with activities pertaining to the project. These include student and faculty development, ARG implementation and undergraduate research.

Funding Support: University

International Collaboration: No

International Travel: No

Ismail Hadimlioglu

Email: ismail.hadimlioglu@tamucc.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Ismail Hadimlioglu is participating in the use of PLTL in intro sequence courses.

Funding Support: University

International Collaboration: No

International Travel: No

Jianchao Han

Email: jhan@csudh.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Han Jianchao is the PLTL and research faculty advisor at CSUDH.

Funding Support: He receives support from BPC funds (CNS-1042341)

International Collaboration: No

International Travel: No

Chris Kiekintveld

Email: cdkiemintveld@utep.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Chris Kiekintveld participated in peer leading courses at UTEP.

Funding Support: University

International Collaboration: No

International Travel: No

Kazimierz Kowalski

Email: kkowalski@csudh.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Kazimierz Kowalski is a faculty research advisor at CSUDH.

Funding Support: He receives support from BPC funds (CNS-1042341)

International Collaboration: No

International Travel: No

Luc Longpre

Email: longpre@utep.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Luc Longpre participated in peer leading courses at UTEP.

Funding Support: University

International Collaboration: No

International Travel: No

Lisnel Morales**Email:** lisnel.morales@upr.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Lisnel Morales (UPRM) assist with the adoption of CAHSI practices .**Funding Support:** University**International Collaboration:** No**International Travel:** No

Mitsue Nakamura**Email:** NakamuraM@uhd.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Mitsue Nakamura trains and supervises PLTL peer tutors at UHD under the supervision of O. Sirisaengtaksin.**Funding Support:** She has received support from other CCSDS sources and some travel funds from BPC (CNS-1042341).**International Collaboration:** No**International Travel:** No

Graciela Perera**Email:** gcpererao77@gmail.com**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Graciela Perera (NEIU) represents a CAHSI adopting institution.**Funding Support:** Dr. Perera's travel has been funded by BPC funds (CNS-1042341)**International Collaboration:** No**International Travel:** No

Maryam Rahnemoonfar**Email:** maryam.rahnemoonfar@tamucc.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Maryam Rahnemoonfar is participating in the use of PLTL in intro sequence courses.**Funding Support:** University**International Collaboration:** No

International Travel: No

Mary K. Roy

Email: mkroy@utep.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 0

Contribution to the Project: Mary Kay Roy participated in peer leading courses at UTEP.

Funding Support: University

International Collaboration: No

International Travel: No

King Scott

Email: Scott.King@TAMUCC.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Scott King supervises MentorGrad students at Texas A&M University - Corpus Christi.

Funding Support: University

International Collaboration: No

International Travel: No

Mehrdad Sharbaf

Email: msharbaf@csudh.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Mehrdad Sharbaf is a faculty research advisor at CSUDH.

Funding Support: He receives support from BPC funds (CNS-1042341).

International Collaboration: No

International Travel: No

Rita Sperry

Email: rita.sperry@tamucc.edu

Most Senior Project Role: Faculty

Nearest Person Month Worked: 1

Contribution to the Project: Rita Sperry is participating in the use of PLTL in intro sequence courses.

Funding Support: University

International Collaboration: No

International Travel: No

Natalia Villanueva**Email:** nvillanuevarosales@utep.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 1**Contribution to the Project:** Natalia Villanueva supervised REU projects at UTEP.**Funding Support:** University**International Collaboration:** No**International Travel:** No

Karen Villaverde**Email:** kpvillaverde@utep.edu**Most Senior Project Role:** Faculty**Nearest Person Month Worked:** 0**Contribution to the Project:** Kare Villaverde participated in peer leading courses at UTEP.**Funding Support:** She does not receive support from BPC.**International Collaboration:** No**International Travel:** No

Wei-Yu Bao**Email:** baow@fiu.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 1**Contribution to the Project:** Dr. Wei-Yu Bao is an experienced programming Instructor with the College of Engineering and Computing. He serves as the Instructor for EEL 2880 offered as the CS0 course this summer of 2014.**Funding Support:** Dr. Bao received support from BPC (CNS-1042341) for serving as Instructor for the CS0 course.**International Collaboration:** No**International Travel:** No

Claudia V Casas**Email:** ccasas@utep.edu**Most Senior Project Role:** Other Professional**Nearest Person Month Worked:** 12**Contribution to the Project:** Claudia Casas is the Project Manager for CAHSI. She manages the activities and accounts within the Computer Alliance for Hispanics including the coordination of meetings and workshops, and interaction with other agencies and national organizations.**Funding Support:** She is supported by BPC funds (CNS-1042341)

International Collaboration: No

International Travel: No

Krystal Escobar

Email: Krystal.Escobar@tamucc.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 6

Contribution to the Project: Krystal Escobar oversees grant activities at Texas A&M University - Corpus Christi.

Funding Support: She receives support from BPC funds (CNS-1042341)

International Collaboration: No

International Travel: No

Rebecca Galves

Email: rgalves@cs.nmsu.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 4

Contribution to the Project: Rebecca Galves is the program coordinator for Young Women in Computing (YWiC). She aid in the management of the CAHSI activities with the department and coordinates with the schools and organizations targeted.

Funding Support: She is supported from NSF CREST funds.

International Collaboration: No

International Travel: No

Felipe Mayelin

Email: mfelip01@fiu.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 1

Contribution to the Project: Assists Malek Adjouadi (FIU) with CAHSI Fellow-Net initiative. FIU is participating in Mentor-Grad, CS0 and PLTL initiatives.

Funding Support: He receives support from BPC (CNS-1042341)

International Collaboration: No

International Travel: No

Stephanie Strange

Email: Stephanie.Strange@fiu.edu

Most Senior Project Role: Other Professional

Nearest Person Month Worked: 2

Contribution to the Project: Stephanie Strange is the FIU Associate Director for the Office of Student Success and

Access with the College of Engineering and Computing. She is responsible for the planning of the summer program and for student recruitment as it relates to CS0 which is offered each summer at FIU with the College of Engineering and Computing

Funding Support: She received support from BPC (CNS-1042341) for running the summer program for CS0.

International Collaboration: No

International Travel: No

Daniela Miranda-Tellez

Email: mirandan@nmsu.edu

Most Senior Project Role: Technician

Nearest Person Month Worked: 4

Contribution to the Project: Daniela coordinates K-12 CAHSI-related activities at NMSU

Funding Support: NSF CE21 award

International Collaboration: No

International Travel: No

Christian Teran Lopez

Email: cteranlopez@miners.utep.edu

Most Senior Project Role: Undergraduate Student

Nearest Person Month Worked: 6

Contribution to the Project: Christian Teran assists with the accounting of the grant

Funding Support: She receives support from BPC (CNS-1042341)

International Collaboration: No

International Travel: No

Sarah Hug

Email: hug@colorado.edu

Most Senior Project Role: Consultant

Nearest Person Month Worked: 3

Contribution to the Project: Sarah Hug is one of two CAHSI evaluators for the grant.

Funding Support: She receives support from BPC funds (CNS-1042341)

International Collaboration: No

International Travel: No

Heather Thiry

Email: heather.smith@Colorado.EDU

Most Senior Project Role: Consultant

Nearest Person Month Worked: 3

Contribution to the Project: Heather Thiry is one of two CAHSI evaluators for the grant.

Funding Support: She receives support from BPC funds (CNS-1042341).

International Collaboration: No

International Travel: No

Noor Muhyi

Email: nmuhyi@gmail.com

Most Senior Project Role: Research Experience for Undergraduates (REU) Participant

Nearest Person Month Worked: 2

Contribution to the Project: Noor is conducting research under the support of a REU supplement

Funding Support: CAHSI

International Collaboration: No

International Travel: No

Year of schooling completed: Junior

Home Institution: New Mexico State University

Government fiscal year(s) was this REU participant supported: 2015

Jeremiah Smith

Email: jsmith79@nmsu.edu

Most Senior Project Role: Research Experience for Undergraduates (REU) Participant

Nearest Person Month Worked: 2

Contribution to the Project: Richard was supported as an REU researcher during Spring 2015

Funding Support: CAHSI

International Collaboration: No

International Travel: No

Year of schooling completed: Sophomore

Home Institution: New Mexico State University

Government fiscal year(s) was this REU participant supported: 2015

What other organizations have been involved as partners?

Name	Type of Partner Organization	Location
A4RC— Alliance for the Advancement of African-American	Other Organizations (foreign or domestic)	Indiana University
Anita Borg Institute for Women and Technology	Other Nonprofits	Palo Alto, CA

Google	Industrial or Commercial Firms	Mountain View, CA
Hispanic Scholarship Fund Institute	Other Nonprofits	Gardena, CA
Latinas in Computing (LiC)	Other Nonprofits	Palo Alto, CA
Microsoft	Industrial or Commercial Firms	Redmond, WA
NCWIT	Other Nonprofits	Boulder, CO
SACNAS	Other Nonprofits	Santa Cruz, CA
Society for Professional Hispanic Engineers (SHPE)	Other Nonprofits	Los Angeles, CA
Team for Research in Ubiquitous Secure Technology (TRUST)	Other Organizations (foreign or domestic)	Berkeley, CA
Texas State University	State or Local Government	San Marcos, TX
The GEM Consortium	Other Nonprofits	Alexandria, VA
CMD-IT	Other Nonprofits	Texas A&M University
The IBM Academic Initiative (AI) program	Industrial or Commercial Firms	Armonk, NY
Young Women In Computing	Other Nonprofits	Las Cruces, NM
CRA Coalition to Diversify Computing (CDC)	Other Nonprofits	Washington, D.C.
CS Ed Week	Other Nonprofits	Washington, D.C.
Computer Science Collaborative Project (CSCP)	Other Nonprofits	Lynnwood, WA
Computing Research Association Education (CRA-E)	Other Nonprofits	Washington, D.C.
CyberWatch West	Other Nonprofits	Walnut, California
Excelencia in Education	Other Nonprofits	Washington, D.C.
Golden Evaluation and Policy Research	Industrial or Commercial Firms	Golden, CO

Full details of organizations that have been involved as partners:

A4RC— Alliance for the Advancement of African-American

Organization Type: Other Organizations (foreign or domestic)

Organization Location: Indiana University

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: A4RC collaborated with CAHSI to disseminate the Affinity Research Group model. CAHSI has shared the FellowNet process documentation with Jeffrey Forbes from NSF, Juan Gilberr, Yolanda Rankin, Quincy Brown, and Jakita Thomas in order to disseminate the initiative through a similar project. A4RC has transition into a new Alliance focused on African American researchers).

Anita Borg Institute for Women and Technology

Organization Type: Other Nonprofits

Organization Location: Palo Alto, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Nayda Santiago at UPRM the Grace Hopper Regional Conference in Puerto Rico in February 2014. This is part of the CAHSI Femprof initiative. Dr. Ann Gates, CAHSI PI, and Patricia Lopez, CAHSI Board of Advisors Member were featured as part of Anita's Quilt – Threads of Inspiration website (<http://anitasquilt.org/welcome/>) as part of a campaign to motivate and empower through stories from other women. CAHSI works on disseminating effective practices for retention of females in computing.

CMD-IT

Organization Type: Other Nonprofits

Organization Location: Texas A&M University

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: CAHSI co-sponsors the Academic Workshops for Underrepresented Participants with CDC, CMD-IT, and AccessComputing. CAHSI actively recruits Hispanics to attend the workshop.

CRA Coalition to Diversify Computing (CDC)

Organization Type: Other Nonprofits

Organization Location: Washington, D.C.

Partner's Contribution to the Project:

Facilities

Collaborative Research

More Detail on Partner and Contribution: CAHSI participates in Data Buddies, an effort in nationwide data gathering . CRA-W and CDC Alliance are gathering data for students from mid-undergraduate through finishing PhD students, post doctorates, and faculty.

CS Ed Week

Organization Type: Other Nonprofits

Organization Location: Washington, D.C.

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: CAHSI promotes CS ED Week to promote computing.

Computer Science Collaborative Project (CSCP)

Organization Type: Other Nonprofits

Organization Location: Lynnwood, WA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Computer Science Collaborative Project (CSCP) is run by Karen Peterson of EdLabGroup in Washington State and funded by the National Science Foundation as part of its Broadening Participation in Computing Program. The goal of CSCP is to increase diversity in computing by building collaborations across K-12, community-based organizations, higher education, and industry. CAHSI collaborates on sharing resources for K-12 outreach and is part of the Engaging Hispanic/Latino (a) Youth Collaboration Leadership Team. CAHSI had discussions with CSCP about collaborating in the proposal writing for an I3 RFP for the Department of Education. CAHSI serves in an advisory position for the Computing Science Collaboration project with the purpose of engaging K-12 Hispanic youth in Computer Science.

Computing Research Association Education (CRA-E)

Organization Type: Other Nonprofits

Organization Location: Washington, D.C.

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: CAHSI personnel assist in the activities of CRA-E

CyberWatch West

Organization Type: Other Nonprofits

Organization Location: Walnut, California

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Dr. Mohsen Beheshti from California State University – Dominguez Hills, Texas A&M – Corpus Christi, and UTEP are members CyberWatch West as part of CAHSI's dissemination and collaboration efforts in the area of cyber-security. The main mission of CyberWatch West is to improve the quantity and quality of the cyber-security/information assurance workforce. Similarly to CAHSI, the consortium shares best practices,

methodologies, curricula, course modules, and materials to support schools seeking to develop further in the area of cyber-security.

Excelencia in Education

Organization Type: Other Nonprofits

Organization Location: Washington, D.C.

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Ann Gates, as a representative for CAHSI, is an affiliate of the Action Agenda with Excelencia in Education that is a select group of people working to address increased college completion rates of Hispanics.

Golden Evaluation and Policy Research

Organization Type: Industrial or Commercial Firms

Organization Location: Golden, CO

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Heather Thiry and Sara Hug previously part of University of Colorado-Boulder, and now independently contracted through Golden Evaluation and Policy Research work on the evaluation of the project.

Google

Organization Type: Industrial or Commercial Firms

Organization Location: Mountain View, CA

Partner's Contribution to the Project:

In-Kind Support

Facilities

Collaborative Research

More Detail on Partner and Contribution: CAHSI has teamed up with Google in a number of activities, include Google DIVE Freshmen Immersion Program. They have reserved opportunities for CAHSI students.

Hispanic Scholarship Fund Institute

Organization Type: Other Nonprofits

Organization Location: Gardena, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Hispanic Scholarship Fund (HSF) HSF is the nation's leading Hispanic

scholarship organization, providing the Hispanic and other underserved communities more college scholarships and educational outreach support than any other organization in the country. HSF will serve as a liaison between potential industry partners and CAHSI. HSF and CAHSI collaborate to develop programs for joint solicitation of sponsorships and new scholarship programs. HSF has provided CAHSI with bilingual pamphlets promoting computing careers for outreach efforts.

Latinas in Computing (LiC)

Organization Type: Other Nonprofits

Organization Location: Palo Alto, CA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Latinas in Computing (LiC) LiC is comprised of Latinas from the industry, government labs and the Academia. Their goal is to define key strategies to promote leadership and professional development among current and next generation of Latinas. Latinas in Computing works with CAHSI in preparing developmental workshops and panels.

Microsoft

Organization Type: Industrial or Commercial Firms

Organization Location: Redmond, WA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: Microsoft provided a Windows 8 development workshop in coordination with CAHSI to support the Microsoft App Madness Challenge Event. Bradley Jensen, Principal Academic Relationship Manager at Microsoft is part of the Board of advisors for CAHSI.

NCWIT

Organization Type: Other Nonprofits

Organization Location: Boulder, CO

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: NCWIT: National Center for Women in Information Technology NCWIT published three Promising Practices handouts that include CAHSI initiatives. CAHSI is adopting practices to increase the number of Hispanic women in computing. CAHSI has collaborated with NCWIT in developing and reviewing content for the development of the REU-in-a-box online resource which is now available through the NCWIT website (<http://www.ncwit.org/reubox>). Ann Gates contributed to the development of the REU-in-a-Box project to incorporate the Affinity Research Group model. CAHSI faculty are active on NCWIT committees and activities, e.g., Aspirations in Computing.

SACNAS

Organization Type: Other Nonprofits
Organization Location: Santa Cruz, CA

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Society for Advancing Hispanics, Chicanos, and Native Americans in Science (SACNAS): This society is dedicated to fostering the success of Hispanic/Chicano and Native American scientists, from college students to professionals in attaining advanced degrees, careers, and positions of leadership. With a focus of expanding to include computing and engineering, SACNAS's Executive Board has approved a partnership with CAHSI to collaborate on the conference and leadership institute. Our organizations both value preparing and advancing students in research careers.

Society for Professional Hispanic Engineers (SHPE)

Organization Type: Other Nonprofits
Organization Location: Los Angeles, CA

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Societies for Professional Hispanic Engineers (SHPE) and CAHSI have collaborated on student development workshops.

Team for Research in Ubiquitous Secure Technology (TRUST)

Organization Type: Other Organizations (foreign or domestic)
Organization Location: Berkeley, CA

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: Berkeley has been working with CAHSI in recruiting students to attend development workshops and participate in research experiences in the TRUST program. CAHSI has entered into an MOU with TRUST and is promoted on the TRUST website (<https://tao.truststc.org/Members/whrobinson/cahsi/?searchterm=CAHSI>).

Texas State University

Organization Type: State or Local Government
Organization Location: San Marcos, TX

Partner's Contribution to the Project:
Collaborative Research

More Detail on Partner and Contribution: CAHSI has been working with Texas State University to finalize an MOU. This new collaboration would be focused on promoting CAHSI best practices at Texas State.

The GEM Consortium

Organization Type: Other Nonprofits

Organization Location: Alexandria, VA

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: GEM Consortium and CAHSI have partnered in GEM workshops, in particular in the preparation of competitive fellowship application sections such as a Statement of Purpose. CAHSI is using these materials for its MentorGrad effort. CAHSI has representation on the scholarship review panel. GEM provided meeting space for the 2014 CAHSI BOA meeting.

The IBM Academic Initiative (AI) program

Organization Type: Industrial or Commercial Firms

Organization Location: Armonk, NY

Partner's Contribution to the Project:

In-Kind Support

Collaborative Research

More Detail on Partner and Contribution: The IBM Academic Initiative (AI) program provides CAHSI institutions with access to software, hardware, workshops, training, tools, books, and discounts with the goal of improving student preparation for information technology and jobs in computing.

Young Women In Computing

Organization Type: Other Nonprofits

Organization Location: Las Cruces, NM

Partner's Contribution to the Project:

Collaborative Research

More Detail on Partner and Contribution: New Mexico State University works with `Young Women in Computing in outreach activities directed to attract middle school students into the Computing fields.

What other collaborators or contacts have been involved?

The BRAID (Building Recruiting And Inclusion for Diversity) initiative was established by Dr. Maria Klawe (President, Harvey Mudd College) as a partnership between the Anita Borg Institute and Harvey Mudd College. The BRAID institutions are Arizona State University, Missouri University of Science and Technology, NJ Institute of Technology, University of California Irvine, University of Illinois at Chicago, University of Maryland, Baltimore County, University of Nebraska-Lincoln, University of North Texas, University of Rochester, Univeristy of South Caroliina, University of Texas at El Paso, University of Vermont, University of Wisconsin-Milwaukee, and Villanova University. The Beacon Institutions are CalPoly State University, MIT, University of Washington, and the University of British Columbia. The BRAID initiative is focused on addressing increased diversity (focus on females) through articulation of recruitment and retention plans that includes participation in the Grace Hopper Conference and accountability each institution's efforts. BRAID is funded by Facebook, Google, Intel, and Microsoft. At the July meeting, PI Gates debriefed the group on the CAHSI efforts.

Impacts

What is the impact on the development of the principal discipline(s) of the project?

The project focuses on the recruitment, retention, and advancement of Hispanics in computing. It has resulted in unified efforts to document and disseminate effective practices that positively impact these areas.

What is the impact on other disciplines?

CAHSI has successfully disseminated some of its best practices to other disciplines. For instance, Northeastern Illinois University has recently received funding to incorporate the Affinity Research Group and Peer-Led Team Learning models into basic introductory STEM courses, including Physical Geology, General Chemistry, and Physics. NEIU collected baseline course data in the academic year 2014-15 and six revised courses in the five departments will be piloted in fall, 2015. California State University- Dominguez Hills is piloting "STEM-0" courses infused with peer-led team learning with assistance from CAHSI leadership. The STEM-0 courses represent multiple STEM disciplines and have been developed with funds from a California system-wide grant. Additionally, the CREST-funded Cyber-ShARE center at the University of Texas, El Paso has adopted the ARG model in many of its research groups, spanning a range of STEM disciplines, including Computer Science, Education, Engineering, Biological Sciences, Geological Science, Information Technology, and Geophysics. The Center employed 58 student researchers in six disciplines, 14 of whom were undergraduate students.

What is the impact on the development of human resources?

Despite the diminished CAHSI presence at the annual Society to Advance Native Americans and Chicanos in Science (SACNAS) meeting, CAHSI students involved in Affinity Research Groups (ARGs) continued to outpace their national peers in NSF research experiences for undergraduates (REUS) in rates of academic presentation and publication. Most of the ARG students (66%) reported that they attended a professional conference, while only 23% of the national sample of REU students had done so ($X=86.864$, $p<.0001$). Additionally, 66% of ARG students presented a paper or poster at a conference, while only 15% of the national sample had done so ($X=49.802$, $p<.001$).

In addition, 66% of ARG students reported that their research experience increased the likelihood that they would pursue graduate school. CAHSI students also had higher aspirations than a national sample of computing students surveyed by the Computing Research Association. For example, 15% of CAHSI students aspired to a doctoral degree, while only 13% of the national sample of students expressed that goal and 38% of CAHSI students aspired to a master's degree while only 32% of CR survey respondents did. ARG students who would be graduating within one year (14 of the 35 total respondents) reported on the steps they had taken to reach graduate school. Four out of the fourteen (29%) students reported that they had taken the GRE and all of those students reported having submitted applications for graduate school. An additional 13 students reported that they *plan* to apply to graduate school and 12 students *plan* to take the GRE in the future.

Students are gaining the skills, knowledge, and confidence from ARGs that they will need in graduate school and the computing workforce. Students' highest reported gains from participating in ARGs were in collaboration/teamwork and personal growth, such as increased confidence and interest. The collaboration scale also measures the extent to which leadership is distributed, the research group works cooperatively and other markers of a high-functioning Affinity Research Group.

CAHSI Hispanic students demonstrated a significantly greater sense of belonging and commitment to their discipline than the national sample of Hispanic CRA computing student survey respondents ($t=-2.506$, $df=412$, $p=.009$). Though not statistically significant, CAHSI Hispanic students perceived more support from a variety of sources, such as family, peers, and mentors, than Hispanic students at non-CAHSI institutions. CAHSI Hispanic students were statistically significantly more likely than non-CAHSI students to participate in a wide range of professional development activities, such as undergraduate research, attending conferences, belonging to computing-related professional societies, or taking a research course ($p<.05$).

What is the impact on physical resources that form infrastructure?

Nothing to report.

What is the impact on institutional resources that form infrastructure?

CAHSI is making progress in institutionalization of its initiatives; for example, CS-0 is fully institutionalized at the undergraduate level, and PLTL is increasingly funded through non-CAHSI means, often departmental or institutional funding. ARG has been sustained through the adoption of ARG strategies directly into coursework, which expands its reach. Therefore, ARG is inherently institutionalized as courses are fully funded outside of CAHSI. In considering influence on institutional resources, it is important to consider how CAHSI is viewed locally, and the extent to which colleagues value the organization and their institution's membership in CAHSI. Concrete evidence of institutional support from horizontal (peers) or vertical (administration/leadership) colleagues was attained from six institutions during the 2014-2015 school year, a substantial increase from last year's four institutions. At two of these schools, CAHSI leaders are advancing and reaching upper echelons of administration within their institutions. The increased visibility of CAHSI leaders as institutional leaders provides greater recognition of CAHSI's work. In two other instances, CAHSI initiatives have been spread to non-CAHSI departments through institutional funding. CAHSI leaders at those schools are advising and supporting and, in some cases, implementing CAHSI initiatives more widely based on these institutional directives. One school with a recent leadership turnover has made plans to bring an administrator to the CAHSI Summit to increase knowledge of CAHSI on their local campus. Yet another institution is using CAHSI strategies as a mechanism to improve departmental climate, and faculty have explicitly written that intention into departmental accreditation planning documents. As CAHSI gains momentum outwardly, fortifying roots within the local environment is essential. Showing how CAHSI aligns with other academic and policy efforts locally can enhance support.

What is the impact on information resources that form infrastructure?

The project has resulted in the adoption of programs at the Alliance institutions that address recruitment, retention, and advancement. A June 2015 report from Excelencia in Education, "Finding your Workforce: Latinos in Science, Technology, Engineering, and Mathematics (STEM)," references CAHSI as "What Works in Academic Support" in (<http://www.edexcelencia.org/research/workforce/stem>).

What is the impact on technology transfer?

CAHSI practices have been adopted by numerous institutions outside of CAHSI and by departments outside of computing, primarily through workshops delivered by CAHSI investigators.

What is the impact on society beyond science and technology?

Researchers from outside of STEM have attended CAHSI workshops that disseminate effective practices.

Changes/Problems**Changes in approach and reason for change**

No change.

Actual or Anticipated problems or delays and actions or plans to resolve them

No problems or delays.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects

Not applicalbe

Significant changes in use or care of vertebrate animals

Not applicable

Significant changes in use or care of biohazards

Not applicable

Special Requirements

Responses to any special reporting requirements specified in the award terms and conditions, as well as any award specific reporting requirements.