Introduction and Goals

Higher education faculty play an important role in both refining technology usage as well as understanding how it best integrates into their curriculum and the teaching and learning environment. HP encourages educators who have a project that redesigns a core course in a way that integrates the granted HP mobile technology and positively impacts student learning to apply for the HP 2005 Technology for Teaching grant initiative.

Full-time faculty who are able to demonstrate academic and instructional leadership in their discipline and/or their campus can submit a grant application. The application should include evidence of how the faculty Principal Investigator (PI) has responded to student needs in the past through course redesign or other methods that have improved student outcomes, and/or reflected the adoption of the PI’s methodologies, pedagogy, or curricula by other faculty members. Project proposals must focus on redesigning a core course in the math, science (life sciences, physical sciences, earth sciences, computer sciences), engineering, or business (including M.B.A.) department. The applicant must be able to clearly describe the fundamental teaching and learning issues that are being addressed by the project and how the granted HP technology will contribute to resolving those issues. Successful projects will result in sustainable advances in teaching and learning.

Additional consideration will be given to projects 1) submitted by low-income serving institutions; 2) that have educational technology and instructional leadership support; or 3) will contribute toward achieving the institution’s vision and plans for broader deployment of mobile technology solutions in the learning environment. We encourage projects that involve multiple professors.

Higher education environments remain some of the richest for implementation of HP’s mobile technology vision. Our goal is that the HP Technology for Teaching Initiative supports the development of mobile technology environments that, at their fullest implementation, will:
- Create new models of success on campus for integrating technology into the learning environment
- Engage faculty in adopting and implementing these models in their classrooms
- Foster publication, demonstration and presentation opportunities for academic leaders on the application of mobile technology in university learning environments

Grants will be awarded to the institution on behalf of the Principal Investigator for the specific purpose of completing the grant proposal.
Description of the Grant Award

Under this initiative cycle, approximately 25 universities will receive:

- An HP Tablet PC product package with products for one faculty member and a classroom, valued at up to $55,000 at HP Internet List Price

**Faculty Presentation Solution:**
- 1– Wireless HP Tablet PC
- 1– Tablet docking station and DVD-CDRW optical drive;
- 1– Portable HP Digital projector

**Classroom Solution:**
- 20– Wireless HP Tablet PCs;
- 10– Tablet docking stations and DVD-CDRW optical drive;
- 1– HP Access Point with wireless card;
- 1– HP 20 unit Laptop cart;
- 1– HP All-in-One inkjet printer and digital camera

- $ 15,000 in cash as a stipend for the Principal Investigator to work on the project. This funding can be shared with other faculty and/or interns supporting the project. The stipend comes to the university as an unrestricted gift. HP will not finance indirect costs.
- $500 in cash to cover miscellaneous travel expenses for one participant to attend a Worldwide HP Mobile Technology Conference in the fall of 2005. HP will provide travel and hotel accommodations for a single participant separately. More information about this conference will be shared with recipients 3-4 months prior to the event.

**Note:** HP plans to create an opportunity for the top projects from 2005 to compete for an additional investment in 2006.

Eligibility Requirements

This is an open grant initiative. Any accredited two- or four-year college or university in the US or Puerto Rico is eligible to apply. Only proposals from full-time faculty members will be considered. A maximum of one grant will be awarded to an institution.

Two- and four-year colleges or universities that received a HP Technology for Teaching grant award in 2004 are not eligible to apply for the HP Technology for Teaching 2005 grant. Review the list of 2004 recipients at: [www.hp.com/go/hpteach](http://www.hp.com/go/hpteach)

A lead faculty member (PI) must be identified in the proposal and be responsible for coordinating the work of the project. All projects require an IT infrastructure with Internet access that can accommodate an 802.11b/g wireless computing Access Point in the location where your project will be deployed and the support of the information-technology organization of the campus.

Review Criteria

Criteria to be used to evaluate the proposals will include, but will not be limited to:

**Essential Conditions**
- An IT infrastructure with Internet access that can accommodate an 802.11b/g wireless computing Access Point in the location where your project will be deployed
- IT is committed to support the use of the granted equipment
Primary Criteria

- The Principal Investigator (full-time faculty) has demonstrated academic and instructional leadership in their discipline and/or their campus
- Project proposals must:
  - Focus on redesigning a core course in the math, science (life sciences, physical sciences, earth sciences, computer sciences), engineering, or business (including M.B.A.) department;
  - Clearly describe the fundamental teaching and learning issues that are being addressed through the project;
  - Describe how the granted HP technology will contribute to resolving the teaching and learning issues;
  - Have specific plans for progress measurement and documentation; and
  - Have specific plans for communicating the project outcomes, on campus and beyond.

Some additional consideration will be given to:

- Low income-serving institutions as defined by the percent of degree students receiving need-based assistance under Title IV of the Higher Education Act
- Projects that have educational technology and instructional leadership support
- Projects that will contribute toward the attainment of the institutions vision and plans for broader deployment of mobile technology solutions in the learning environment

Grant Recipient Commitment

In accepting the HP Technology for Teaching grant, recipients agree to:

- Complete the proposed grant project
- Provide the proper IT infrastructure and support to ensure program success, including installation and proper maintenance
- Provide HP with updates on the progress of the project at the end of each term for up to 15 months after the grant has been delivered
- Participate in a Worldwide HP Mobile Technology Conference in the Fall of 2005 (Funding for travel and accommodations for one participant will be provided by HP)

Submitting Your Proposal

If you feel you meet the eligibility requirements and are willing and able to fulfill the grant recipient commitments associated with this grant, please respond to this Request for Proposal (RFP) by entering your answers in the online grant application area of the HP Technology for Teaching website [www.hp.com/go/hpteach](http://www.hp.com/go/hpteach) by 5:00 p.m. Pacific time, Tuesday, February 15, 2005.

Further information regarding the format and process for submitting your proposal can be found at the HP Technology for Teaching website.

In the online application you will be asked to enter responses to the following questions directly into fields in the order shown. You may want to first compose your responses to these questions in a file, then cut and paste the responses into the corresponding fields of the online application.
Required Elements of Your Proposal

**Institutional Environment**

1. **Technology vision (~150 words):**
   a. Describe your campus or school vision on the role of mobile technology in learning environments.
   b. To assist us in understanding your project, please let us know on a scale of 1 to 5, with 1 being just beginning and 5 being advanced deployment, in terms of how far along your campus is on the road to achieving its mobile technology vision. HP is interested in projects at all stages of deployment.

2. **Synergy (~150 words):** How will the project you’re proposing for this grant help you make a substantial contribution toward achieving the educational technology vision on your campus?

**Academic and Institutional Leadership**

3. **Academic leadership (~150 words):** Describe how you have demonstrated academic leadership, as evidenced by 1) the adoption of your teaching methodologies, pedagogy, or curricula, or 2) other tangible evidence

4. **Instructional leadership (~150 words):** Describe how you have demonstrated instructional leadership, as evidenced by 1) course changes have you made, in response to student needs, that have improved student outcomes in your courses, or 2) other tangible evidence

**Project Details**

5. **Project executive summary (~200 words):** Provide a high-level overview of your project in an executive summary. Describe how students will benefit from the course redesign and the application of mobile technology.

6. **Teaching and learning issues (~200 words):** Describe the fundamental learning and teaching issues that the project addresses (i.e. Why is this project important for your students and instructors?)

7. **Goals, objectives and outcomes (~200 words):** Describe the project goals, objectives, and anticipated outcomes from the perspective of impact on student learning

8. **Measures (~200 words):** What indicators of advancement in student learning will be measured and how will they be documented?

9. **Project timeline:** Describe the project timeline and milestones

10. **Technology integration (~200 words):** Describe how you plan to use the granted HP products to support the goals of your project and how will the granted HP technology contribute to resolving the fundamental problem or opportunity this project addresses

**Project Context**

11. **Course impacted (~100 words):** Describe the course or courses that will be re-designed for this project (include course number). Course # Required____
    Course Level Required : ___Undergraduate ____Graduate

12. **Course redesign (~200 words):** Describe how the course will be altered to take advantage of the technology

13. **Department where course resides:** This is a core course in one of the following departments:
    □ Math, □ Science (life, physical, earth or computer sciences), □ Engineering, □ Business (including M.B.A.)

14. **Faculty (~25 words):** How many professors/faculty will be directly involved in this project?

15. **Students (~25 words):** Approximately how many students will be impacted during the first full year of this pilot project implementation?

16. **On-going student impact (~25 words):** Approximately how many students will be impacted per academic year when this course design is fully implemented?
17. **Student financial need:** What percentage of your degree students receive need-based assistance under Title IV of the Higher Education Act? (This information should be available through your financial aid office or online at [http://nces.ed.gov/ipeds/cool/index.asp](http://nces.ed.gov/ipeds/cool/index.asp) select the “Financial Aid” tab. Please indicate the percentage of students receiving Federal grants at your institution.)

18. **Ethnic representation:** Please indicate the ethnic representation of students at your institution (give percentages, which must total 100%)  
☐ African American, ☐ Asian/Pacific Islander, ☐ Caucasian/White, ☐ Hispanic, ☐ Native American, ☐ Other

19. **Campus involvement (~100 words):** How will your campus educational technology and instructional leaders be involved in this project? What other departments or functions, if any, will provide support to the project?

20. **IT infrastructure:** The environment where my project will be deployed has an IT infrastructure with Internet access that can accommodate an 802.11b/g Access Point [Yes/No]

21. **IT support (~50 words):** Describe the support the IT department has committed to providing to this project (such as support for networking, Tablet PC imaging, onsite help, etc.)

22. **Project visibility (~100 words):** Please describe your interest in and method for developing visibility for the project on your campus and beyond (publications and presentations at academic events, industry events, etc.).

23. Please provide the following contact details:
   - **Principal Investigator:** Name, title, discipline, address, phone, fax, e-mail
   - **Secondary Contact:** Name, title, discipline, address, phone, fax, e-mail
   - **Additional Team members:** Name, title, role on project, e-mail address
   - **Institution Name:** Legal name, mailing address, phone, fax
   - **Institution Mission Statement:** describe the mission of the institution
   - **Institution TaxID number:** (9 digit IRS number)
   - **Shipping Instructions:** Individual’s name, phone, fax, e-mail, shipping address for equipment delivery.

**Deadline for Submission**  
Your proposal must be completed online and submitted via the online application system accessed through [www.hp.com/go/hpteach](http://www.hp.com/go/hpteach) no later than **Tuesday, February 15, 2005**, at 5:00 p.m. Pacific time.

**Notification of Recipients**  
HP will make award announcements no later than May 1, 2005. On May 1, the HP Technology for Teaching website [www.hp.com/go/hpteach](http://www.hp.com/go/hpteach) will show a list of schools that have been funded.

**About HP**  
HP is a technology solutions provider to consumers, businesses and institutions globally. The company’s offerings span IT infrastructure, personal computing and access devices, global services and imaging and printing for consumers, enterprises and small and medium businesses. For the four fiscal quarters ended July 31, 2004, HP revenue totaled $78.4 billion. More information about HP is available at [http://www.hp.com](http://www.hp.com).

**For Further Information**  
Visit the HP Technology for Teaching Grant Website at [www.hp.com/go/hpteach](http://www.hp.com/go/hpteach). If your questions are not addressed in the Frequently Asked Questions area, you are welcome to submit your own question.
INSTITUTIONAL ENVIRONMENT

Question #1a—Technology vision (~150 words): Describe your campus or school vision on the role of mobile technology in learning environments.

The California State University, Chico (CSUC) campus is committed to the integration of technology in the classroom. This commitment is exemplified by CSUC's Information Technology Plan, detailed in a report titled "Beyond 2000: Building the Electronic Learning Community" (see http://www.csuchico.edu/inf/B2000/). The campus vision involves "the effective use of resources to support successful learning outcomes for students." Current technology at CSUC supports a learning environment characterized by the availability of course management systems (e.g. WebCT, Chico State Connection Portal), distributed learning technology (e.g. HorizonLive!), wired and wireless network connectivity, smart classrooms (see http://www.csuchico.edu/classrms/), and various technology-related support services. Wireless connectivity is available in many locations across campus via 802.11b/g wireless computing Access Points (see http://www.csuchico.edu/cns/). The CSUC campus recognizes that faculty and students are increasingly reliant on the Internet and computers as part of their learning environment. The university is dedicated to providing selective wireless connectivity for portable and hand-held devices in classrooms as required for instructional needs.

Question #1b—Stage of deployment: To assist us in understanding your project, please let us know on a scale of 1 to 5, with 1 being just beginning and 5 being advanced deployment, in terms of how far along your campus is on the road to achieving its mobile technology vision. HP is interested in projects at all stages of deployment. NOTE: This section is not scored. However, it is helpful for us to understand where your project fits into the campus mobile technology plan.

Question #2—Synergy (~150 words): How will the project you're proposing for this grant help you make a substantial contribution toward achieving the educational technology vision on your campus?

The PI's department belongs to the College of Engineering, Computer Science, and Construction Management (ECC). As such, the College is a Technology-oriented college offering highly technical degrees in various branches of engineering and the computing sciences. It seems appropriate that the College of ECC set the standard for achieving the educational technology vision of the CSUC campus. The requested equipment will impact instructional, research, and outreach activities that are currently offered and managed by the CSUC Intelligent Systems Laboratory (ISL). From an instructional point of view, the portable mobile equipment will facilitate the management of a "virtual classroom/lab" that can be moved and set up in any available classroom. Students will experience programming and controlling various intelligent systems (typically robots, such as the Sony AIBO quadruped) available through the ISL. The requested equipment will also foster research in robotics-based location sensing using wireless Ethernet, and wireless LAN location sensing for security applications. The requested equipment would be crucial for student participation in Robocup competitions and/or student/faculty use for conference presentations. Finally, for outreach, the portable mobile equipment and projection system can be used to significantly enhance the quality, flexibility, and portability of various workshops, seminars, and demonstrations managed/ordinated by the ISL.

EVIDENCE OF ACADEMIC AND INSTRUCTIONAL LEADERSHIP

Question #3—Academic Leadership (~150 words): Describe how you have demonstrated academic leadership, as evidenced by 1) the adoption of your teaching methodologies, pedagogy, or curricula, or 2) other tangible evidence.
The PIs' teaching methodologies include extensive use of technology for course management and assessment. They use WebCT for keeping track of daily course coverage of topics (via the Calendar tool), giving online quizzes, facilitating discussion and sharing of information (via the Bulletin and Chat tools), keeping students abreast of their current class standing, and more. For assessment, the PIs use MOSS (see http://www.cs.berkeley.edu/~aiken/moss.html) for plagiarism detection of programming assignments and www.turnitin.com for all other writing assignments. The PI also successfully manages four (4) courses currently being offered through distance education (archived lectures delivered through HorizonLive!).

The PIs received a $346,188 grant award from the National Science Foundation (Proposal Title: Acquisition of robotics equipment for an Intelligent Systems Laboratory) last Fall 2003. The PIs developed CSCI 224, Robotics and Machine Intelligence, which was first offered at CSUC last Fall 2003. This multidisciplinary course gives both engineering and computer science students the experience of working together in group projects where they design and implement intelligent systems for specific tasks.

The co-PI has co-taught several courses with faculty from Psychology and Philosophy. In these courses, the co-PI brings technology not only to the students, but also shares technological ideas for improved instruction to the co-instructors.

Question #4—Instructional Leadership (~150 words): Describe how you have demonstrated instructional leadership, as evidenced by, 1) course changes have you made, in response to student needs, that have improved student outcomes in your courses, or 2) other tangible evidence.

The PIs have begun integrating resources from the NSF grant into existing curricula. This integration supports proof-of-concept and provides a tangible physical platform for the analysis of AI methods. For example, the LEGO Mindstorms were used to introduce students to Lisp.

Last Fall 1999, the PI taught CSCI 233/333, User Interface Design and Implementation. Previously, the course was taught with Microsoft's MFC using the Microsoft Visual C++ compiler. In order to make the course platform independent, the PI taught MFC for less than half the semester, and then focused on Perl/Tk as the programming language for class projects. (See http://www.ecst.csuchico.edu/~juliano/csci233 for additional information.)

Last Spring 2003, the PI co-authored a paper titled, "Observations from using two modes of teaching undergraduate computer architecture," with two students (see http://www.ecst.csuchico.edu/~juliano/Papers/PDF/iticse2003.pdf). This paper compares the standard face-to-face interaction of "live" classes to the non-standard online/archived experience available through distance education. The PI used the results of this study to improve the quality of on-line materials.

The PIs are also continuously involved in updating and modifying the curriculum for CSCI 224, Robotics and Machine Intelligence. (See http://www.ecst.csuchico.edu/~juliano/csci224 for additional information.)

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PROJECT DETAILS

Question #5—Project Executive Summary (~200 words): Provide a high-level overview of your project in an executive summary. Describe how students will benefit from the course redesign and the application of mobile technology.

This project aims to integrate the use of wireless/mobile technology with robotics education. Robotics education is teaching with and about robots. Students at all levels are naturally fascinated with robots. Studies show that teaching with robots facilitates interest and motivation in students to learn science, math, mechanics, teamwork and even management skills. The requested HP Grant equipment will be used for setting up mobile computing needs for the Intelligent Systems Lab (ISL; see http://www.gotbots.org) and the AI course curriculum. The ISL is currently being used for both instruction and research in intelligent systems design and implementation. Additionally, the ISL is involved in outreach activities through demonstrations/workshops for K-12 students. In particular, the ISL hosts an annual Summer Robotics Camp for junior high school girls to interest and recruit females into mathematics, the sciences, and engineering (disciplines where women are significantly under-represented).

The requested equipment will facilitate instruction in the classroom, the lab, and robotics arenas at other locations both on and off campus - alleviating the complications that arise from space, access, and connectivity issues. The equipment will also make it easier for faculty and students performing intelligent
systems research to test and/or demonstrate their work at various locations on and off campus. Outreach activities and recruitment efforts are improved since the equipment provides additional flexibility for delivery of workshops, seminars, and exhibits.

PROJECT DETAILS

Question #6—Teaching and learning issues (~200 words): Describe the fundamental learning and teaching issues that the project addresses (i.e. Why is this project important for your students and instructors?).

This project addresses the following fundamental learning and teaching issues:

1) Availability of classrooms for intelligent systems computing needs. The requested portable equipment provides a "virtual classroom" where the students and instructors are not constrained by the characteristics and limitations of a physical classroom. This allows scheduling of intelligent systems courses in regular classrooms that could be used for lecture and possibly the same room (or another location) with the portable equipment used for lab work.

2) The portable and wireless capabilities of the requested equipment facilitates the offering of courses geared towards the use of the K-Team Khepera II and Sony AIBO quadrupe robot platforms.

3) Learning will be enhanced by the availability of all necessary intelligent systems specific software installed locally on these portable devices. (Currently, the ISL relies on intra-department licenses and installations.)

4) Facilitate research in search & rescue and location sensing. The requested equipment could be used as a "virtual lab". Typical search and rescue operations are performed in remote, unknown locations. The ability to test/demonstrate work in various locations is desirable. In particular, the ISL Robocup student team will use its Sony AIBO robots (wireless access) in competition (see www.robocup.org). There is limited availability (space and scheduling) of rooms on campus that can accommodate the 20'x14' playfield.

5) The ISL currently has no portable equipment to deliver seminars and workshops to remote locations as part of its outreach activities. The ISL has given career workshops and robotics seminars/demonstrations to K-12 students both on and off campus. The requested equipment will allow ISL to expand its outreach activities by bringing the "lab" to these prospective students.

PROJECT DETAILS

Question #7—Goals, objectives and outcomes (~200 words): Describe the project goals, objectives, and anticipated outcomes from the perspective of impact on student learning.

Goal(s): Integrate use of wireless/mobile technology with intelligent systems education, research, and outreach.

Objectives:
1) Provide a model portable "virtual classroom" that facilitates deployment of wireless/mobile technology in a classroom, laboratory, or exhibition/competition arena by ensuring ready access to all course-required and platform-specific software on one portable platform.
2) Provide a model portable "virtual laboratory" that facilitates deployment of wireless/mobile technology for testing and presentation purposes at various locations on and off campus.
3) Provide a model portable "virtual laboratory" to support outreach (seminars, workshops, demonstrations) and efforts to recruit underrepresented groups into the mathematical sciences and engineering.
4) Improved instruction and learning via support of the Robocup curriculum.

Outcomes:
1) Exhibit appropriateness of a portable "virtual classroom" that facilitates deployment of wireless/mobile technology in a classroom, laboratory, or exhibition/competition arena.
2) Demonstrate feasibility of a portable "virtual laboratory" that facilitates deployment of wireless/mobile technology for testing and presentation purposes at various locations on and off campus.
3) Illustrate suitability of a portable "virtual laboratory" to support outreach (seminars, workshops, demonstrations) and efforts to recruit underrepresented groups into the mathematical sciences and engineering.

Question #8—Measures (~200 words): What indicators of advancement in student learning will be measured and how will they be documented?

The following indicators of advancement in student learning will be measured:
1) Quantitative and qualitative results from Student Evaluation of Teaching (SET) for impacted courses
2) Student performance (test scores, pass/fail rate, etc.) in impacted courses
3) Demonstrated increased skill set in using simulators, compilers, and firmware
4) Number and quality of student/faculty research papers and research-related activities
5) Number and quality of outreach and recruitment activities
6) Results from surveys and comments of outreach activities
7) Demonstrated success in robotics competitions

This project's dissemination plan includes:
1) Publication of any pertinent results in (Computer Science) Education conferences/journals
2) Post significant findings on ISL website (www.gotbots.org), emphasizing contributions from funding agencies and institutions
3) Track projects, seminars, workshops, papers, presentations, etc. resulting from this project

PROJECT DETAILS

Question #9—Project timeline: Describe the project timeline and milestones (Projects are to be implemented in the 05-06 school year; evaluations can extend beyond this timeframe by several months). Please enter text only into this field (no bullets, graphics, tables, or special characters), e.g. date followed by milestone description.

Summer 2005:
* Summer Robotics Camp for Junior High School Girls.
* Setting up the portable equipment as a "virtual classroom" and a "virtual lab"
* Use part of grant award stipend for summer pay for PI and Co-PI to manage equipment setup and testing

Fall 2005:
* Co-PI will have full release (through sabbatical leave) from teaching; allows focus on Robocup-related activities (4-legged league with Sony Aibo robots) and integration of new technologies into existing curriculum, and creation of AIBO-specific curriculum.
* Use of portable equipment in teaching CSCI 223/323 (AI) and/or CSCI 224/329 (Robotics and Machine Intelligence)
* Use of portable equipment for intelligent systems research
* Use of portable equipment for outreach activities and community college visits in conjunction with MESA efforts to target colleges with under-representation
* Attend/participate in Worldwide HP Mobile Technology Conference

Spring 2005:
* PI on reduced load (via award stipend) for additional involvement in research and outreach activities
* Use of portable equipment in teaching CSCI 223/323 (AI) and/or CSCI 224/329 (Robotics and Machine Intelligence)
* Use of portable equipment for intelligent systems research
* Use of portable equipment for outreach activities and community college visits in conjunction with MESA efforts to target colleges with under-representation

NOTE: If award is granted in Fall 2005, then Summer 2005 above can be moved to Summer 2006 with setup moved to Fall 2005.

Question #10—Technology integration (~200 words): Describe how you plan to use the granted HP products to support the goals of your project and how will the granted HP technology contribute to resolving the fundamental problem or opportunity this project addresses.
The requested equipment will be used as follows:

1) Wireless HP Tablet PCs: configure for dual-boot MS WinXP and Slackware 10.1 Linux to support at least the following software
- LEGO Mindstorms Robotics Invention System 2.0
- Parallax PBASIC Compiler for BASIC Stamp 2
- NetMedia BasicX Compiler for BasicX-24
- GNU C cross-compiler and KTProject compiler for K-Team Khepera II minirobots
- Tekkotsu 2.3 development framework for Sony AIBO ERS-220A
- Sony Master Studio for Sony AIBO ERS-7M2
- OPEN-R Sony AIBO Software Development Environment
Use of integrated wireless capabilities for communication, teleoperation, and location sensing activities with robotics equipment.

2) Portable HP Digital projector: for lectures, presentations, workshops, seminars, demonstrations, etc. that are part of the ISL education, research, and outreach goals.

3) Tablet docking stations and DVD-CDRW optical drive, and HP All-in-One inkjet printer and digital camera: support digital recording and documentation of project-related activities.

4) HP Access Point with wireless card: provides mobile deployable wireless connectivity, specially for off-campus seminars and workshops.

5) HP 20 unit Laptop cart: storage and moving of computing equipment that is part of the "virtual classroom/lab"

The CSU system consists of institutions whose primary focus is teaching and instruction, reflected in the normal teaching load of four (4) courses per semester. Faculty at CSUs are expected to have a 15-unit workload per semester: 12 units of teaching and 3 units of service. Research, creative, and scholarly activities - expected, although not accounted for - need to be produced in somewhat creative ways. The HP Grant stipend will be used for buyout/course release for the PI and co-PI.

PROJECT CONTEXT

Question #11a—Course impacted (~100 words): Describe the course or courses that will be re-designed for this project (begin with course number).

CSCI 223/323: Artificial Intelligence
An introduction to the basic principles, techniques, and applications of Artificial Intelligence. Coverage includes knowledge representation, logic, inferencing, problem solving, search algorithms, game theory, perception, learning, planning, and agent design. Students will program with AI language tools. Additional areas may include expert systems, machine learning, natural language processing, computer vision, cognitive science, neural networks, fuzzy logic, and genetic algorithms.

CSCI 224/329: Robotics and Machine Intelligence
This course introduces students to the field of robotics by emphasizing the task of endowing machines with intelligence. Topics include various case studies of robot architectures and algorithms that facilitate embodying a robot with behaviors that are traditionally associated with human cognition (e.g., perception, reasoning, intelligent navigation, vision, learning, etc.).

Question #11b—Course Level:
- [ ] Graduate
- [x] Undergraduate

Question #12—Course redesign (~200 words): Describe how the course will be altered to take advantage of the technology.
CSCI 223/323: Theory of Artificial Intelligence
- Integrate use of wireless tablet PCs with ISLs three Sony ERS-220As and ten Sony ERS-7M2 AIBO robots
- Update curriculum to spark interest/involvement with a CSUC Robocup team
- Encourage potential conference/competition participation

CSCI 224/329: Robotics and Machine Intelligence
- Integrate use of wireless tablet PCs with ISLs 30 LEGO Mindstorms kits, 30 TAB BYORKs, 10 Parallax Boe-Bots, etc.
- Update curriculum to include teleoperation, location sensing, and distributed planning

Additional impact: research and outreach
- Assign a unique IP address per robot and use tablet PCs to control a specific robot (may require the purchase of additional HP-compatible equipment for NIC)
- "tablet-bot" idea: investigate SWARM/HIVE tasks where a tablet is used as a robot platform; each tablet-bot can act as an access point for longer range communication
- Modify and "pre-package" seminars, workshops, and presentations (for recruitment) for delivery to remote locations

Note:
* Impacted courses are mixed undergraduate and graduate.
* Since every robot needs its control software downloaded from a computer, tablet PCs provide a portable means to deliver demos and presentations.

Question #13—Department where course resides. This is a core course in one of the following departments:

- [ ] Math
- [x] Science (life, physical, earth, or computer science)
- [ ] Engineering
- [ ] Business

PROJECT CONTENT

Question #14—Faculty: How many professors/faculty will be directly involved in this project?
2

Question #15—Students: Approximately how many students will be impacted during the first full year of this pilot project implementation?
80

Question #16—On-going student impact: Approximately how many students will be impacted per academic year when this course design is fully implemented?
110

Question #17—Student financial need: What percentage of your degree students receive need-based assistance under Title IV of the Higher Education Act? (This information should be available through your financial aid office or online at http://nces.ed.gov/ipeds/cool/index.asp select the “Financial Aid” tab. Please indicate the percentage of students receiving Federal grants at your institution.)
24%

Question #18—Ethnic Representation: Please indicate the ethnic representation of students at your institution (enter one number in each field, between 0 and 100; round up if necessary - for example, enter 46 for 45.6%; must total 100)
African American 2%
Asian/Pacific Islander 6%
Caucasian/White 66%
Hispanic 11%
Native American 1%
Other 14%
Total 100%

PROJECT SUPPORT AND VISIBILITY

Question #19—Campus Involvement (~100 words): How will your campus educational technology and instructional leadership be involved in this project? What other departments or functions, if any, will provide support to the project? Note – the educational technology and instructional leadership may not be a formal function or a separate department or organization.

The Departments of Computer Science (CSCI) and Mechanical and Mechatronic Engineering (MEM) of the College of Engineering, Computer Science, and Construction Management (ECC) have been directly involved and supportive of the efforts and activities of the ISL. CSUC also has a Center for Excellence in Learning and Teaching (CELT) (see http://www.csuchico.edu/celt/) that seeks to enhance the quality of our academic environment by finding ways to improve the learning process. Annual CELT conferences explore, publicize, and assist in the development of campuswide programs to enhance student, faculty, and staff learning. CELT provides a means to disseminate results of this project. There is also support from the CSUC Academic Affairs Office as evidenced by CSUC Provost Scott McNall's statements in “Teaching and Learning with Technology” (see http://www.csuchico.edu/pub/inside/archive/02_05_02/provost.html).

Question #20—IT Infrastructure: The environment where my project will be deployed has an IT infrastructure with Internet access that can accommodate an 802.11b/g Access Point [Yes/No].

Yes  No

Question #21—IT Support (~50 words): Describe the support the IT department has committed to providing to this project (such as support for networking, Tablet PC imaging, onsite help, etc.).

IT support will come directly from two departments in CSUC’s Communications Services: Communications Network Services (see http://www.csuchico.edu/cns/) for issues related to wireless connectivity, and Telecommunications Services (see http://www.csuchico.edu/tsrv/) for all other issues. ISL student research assistants can maintain the tablet PCs. (Note: The ISL currently uses HP Pavillions for desktop computing.)

Question #22—Project Visibility (~100 words): Please describe your interest in and method for developing visibility for the project on your campus and beyond (publications and presentations at academic events, industry events, etc.).

The ISL will continue to maintain visibility through its website at www.gotbots.org - highlighting this project, research work, student involvement, outreach activities, progress reports, etc. The PIs will also participate in CELT and CELT-like conferences, CSUC academic events (Preview Day, Minds in Motion), student competitions, etc. Whenever possible, journal publications (IEEE Transactions) and presentations at conferences (e.g. IEEE Frontiers in Education, ACM Technical Symposium on Computer Science Education) will also be targeted.

GRANT RECIPIENT DETAILS

Question #23a—Please provide the following contact details for the Principal Investigator:
Principal Investigator

Title: Associate Professor, Computer Science
Salutation: Dr.
First Name: Ben
Middle Name: A. (optional)
Last Name: Juliano
Suffix: (optional)
Relationship to Director, Intelligent Systems Lab
Institution/Title

Address Line 1: CSUC Computer Science
Address Line 2: 400 West First Street (optional)
   City: Chico
   State: CA
   Zip 94929-0410
   Telephone: (530) 898-4619 ext.
   Fax: (530) 898-5995 (optional)

   Email: Juliano@csuChico.edu

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GRANT RECIPIENT DETAILS

Question #23b—Please provide contact details for the individual who will take delivery of granted equipment. This "Deliver-To Contact" will also be receiving automated emails regarding order delivery and shipment status.

Deliver-To Contact

Title: Associate Professor, Computer Science
Salutation: Dr.
First Name: Ben
Middle Name: A. (optional)
Last Name: Juliano
Suffix: (optional)

Address Line 1: CSUC Computer Science
Address Line 2: 400 West First Street (optional)
   City: Chico
   State: CA
   Zip 95929-0410
   Telephone: (530) 898-4619 ext.
   Fax: (530) 898-5995 (optional)

   Email: Juliano@csuChico.edu

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GRANT RECIPIENT DETAILS (optional)
Question #23c—Please provide the following contact details for a Secondary Contact (if appropriate):

Secondary Contact

Title: Associate Professor, Computer Science
Salutation: Dr.
First Name: Renee
Middle Name: S. (optional)
Last Name: Renner
Suffix: (optional)

Address Line 1: CSUC Computer Science
Address Line 2: 400 West First Street (optional)
City: Chico
State: CA
Zip: 95929-0410
Telephone: (530) 898-5419 ext.
Fax: (530) 898-5995 (optional)
Email: Renner@csuchico.edu

GRANT RECIPIENT DETAILS (optional)

Question #23d—If appropriate, please provide contact details for up to three additional team members:

Other contact (#1)

Title:
Salutation:
First Name:
Middle Name: (optional)
Last Name:
Suffix: (optional)

Address Line 1:
Address Line 2: (optional)
City:
State:
Zip:
Telephone: () - ext.
Fax: () - (optional)
Email:

Other contact (#2)

Title:
Salutation:
First Name:
Middle Name: (optional)
Last Name:
Suffix: (optional)

Address Line 1:
Address Line 2: (optional)
City:
State:
Zip
Telephone: () - ext.
Fax: () - (optional)

Email:

Other contact (#3)

Title:
Salutation:
First Name:
Middle Name: (optional)
Last Name:
Suffix: (optional)

Address Line 1:
Address Line 2: (optional)
City:
State:
Zip
Telephone: () - ext.
Fax: () - (optional)

Email:

GRANT RECIPIENT DETAILS

Question #23e: Please provide the following information about your institution:

Federal Tax Payer ID: EIN 68-0386518 (9 total digits: NN-NNNNNNN)
Legal Name/Oranization Name:
California State University, Chico
Also Know As: Chico State (optional)
In Care Of Organization: (optional)
Relationship to In Care of Organization: (optional)

Address Line 1: 400 West First Avenue
Address Line 2: (optional)
City: Chico
State: CA  
Zip 95929  
Telephone: (530) 898-4636 ext.  
Fax: (530) 898-5995

Institution Mission Statement: California State University, Chico is a comprehensive university serving Northern California and other regions of the state, as well as the nation and the world, through instruction, research, and public service.

Our first priority is the education of our students by creating and maintaining selected quality undergraduate and graduate programs. We will be known for the purposeful integration of liberal and applied learning that provides our students with the knowledge, skills, and moral and intellectual virtues that form the basis for life-long learning and contribution.

We affirm the importance of scholarship and public service. We support the exploration of the frontiers of knowledge, the integration of ideas, the connecting of thought to action, and the inspiring of students.

We make the results of these academic efforts available for public scrutiny by all our constituents. We will maintain extensive continuing education and public service programs that serve the needs of our varied constituencies.

Organization Website: http://www.csuchico.edu (optional)

Terms and Conditions—To be eligible for this grant, the institution must accept the terms and conditions.

- **Terms & Conditions:** Our responsible administrator has reviewed the HP Grant Terms & Conditions available online at http://grants.hp.com/us/programs/tech_teaching/terms.pdf; our institution agrees to the terms and conditions, and no other terms and conditions shall apply.

- Our institution does not agree to the terms and conditions.

**NOTE:** To be eligible for this grant, the institution must accept the terms and conditions.
Please note the following guidelines regarding Terms and Conditions for the HP Technology for Teaching Grants:

**Product Gift**
- This product offer is for the agreed upon granted products per the grant guidelines.
- This product gift is for specific use as outlined in the “HP Approved Grant Usage” section of your “Confirmation Approval” email or as specified in the grant initiative guidelines.
- Products include standard manufacturers warranty.
- The product list cannot be changed by the recipient after HP has placed the product order.
- HP will place a product gift order immediately after the decision of the grant approval.
- If any listed product or service is unavailable for any reason, HP may choose a suitable substitute.
- Delivery of your products may vary depending upon availability, but normally shipments occur within four - six weeks of the product order. Product shipments are not coordinated, which may result in one or more shipments. If after six weeks you have not received your entire gift, you should contact the HP Philanthropy Order Delivery and Management Department at 650-857-2045.
- Please have the following grant reference numbers available when communicating with HP for product grant inquiries such as shipment status, delivery or warranty issues: your grant Request ID Number from your “Approval Confirmation” email or your Order Number or PO Number from your “Shipment Confirmation” email or on the packing slip of the grant.
- Upon completion of your gift shipment, you will be required to sign an acknowledgement of receipt and certification of use form which is required by the IRS for HP’s tax returns. These forms will be mailed to you following shipment completion. Please sign and promptly return these important forms.
- This gift is intended for use only in the United States.
- Selecting “I Agree to the Terms and Conditions” (online) establishes the agreement under which you receive your Product Gift Order and acknowledges that you accept the attached Terms and Conditions of Gift.
- If your organization is not able to agree to the Terms and Conditions, select “I Do Not Agree to the Terms and Conditions”. Please note: your grant application will not enter the proposal review process unless the Terms and Conditions are agreed to.

**Cash Gift**
- This cash gift is for specific use as outlined in the “HP Approved Grant Usage” section of your “Confirmation Approval” email or as specified in the grant initiative guidelines.
- Education institutions acknowledge and agree not to use HP cash awards/grants for institutional overhead.
- Please reference your grant Request ID Number from your “Approval Confirmation” email when communicating with HP regarding cash grant inquiries.
- Agreeing to HP’s Terms and Conditions, indicates your intent to use this solely within the United States and for the purpose stated above, and that your organization has not provided any goods or services in consideration, in whole or in part, for this cash grant.
- Agreeing to HP’s Terms and Conditions, indicates your intent that these funds will be managed by a U.S. – based non-profit organization and for the approved intended purpose, and that your organization has not provided any goods or services in consideration, in whole or in part, for this cash grant.
- Selecting “I Agree to the Terms and Conditions” (online) establishes the agreement under which you receive your Cash Gift and acknowledges that you accept the attached Terms and Conditions of Gift.
- If your organization is not able to agree to the Terms and Conditions, select “I Do Not Agree to the Terms and Conditions”. Please note: your grant application will not enter the proposal review process unless the Terms and Conditions are agreed to.

**Gift Contacts:**
- HP Philanthropy, Order and Delivery Management Department
- **Product Gifts:** (650) 857-2045  **Cash Gifts:** (407) 207-9400
Hewlett-Packard Philanthropy and Education
Terms and Conditions of Gift

The Product Gift Order, including the gift of Products and Support and license of Software, is governed by these Terms and Conditions of Gift.

1. DEFINITIONS

   a) “Delivery” means standard shipping to and arrival at the receiving area at the “Ship To” address in the country where Recipient's Product Gift Order is placed, unless otherwise indicated on the quotation.

   b) “Exhibits” means attachments that describe or otherwise apply to the gift or license of Products or Support.

   c) “Intellectual Property Right” means patents, copyrights, trade secrets, and trademarks.

   d) “Manufacturer” means the entity that manufactures or otherwise provides Products and Support covered by the Product Gift Order, whether HP or a third party.

   e) “Products” means hardware, Software, documentation, accessories, supplies, parts and upgrades that are provided by the respective Manufacturer pursuant to the Product Gift Order.

   f) “Recipient” means the recipient of the Product Gift Order.

   g) “Software” means any software program capable of operating on a controller, processor or other hardware Product ("Device"), whether a separate Product included with another Product or fixed in hardware and not removable in normal operation.

   h) “Specifications” means specific technical information about Products which is published in Product documentation in effect on the date Recipient's Product Gift Order is shipped.

   i) “Support” means hardware maintenance and repair, Software updates and maintenance, training, and other standard support services provided by the Manufacturer.

2. DELIVERY

   Delivery is subject to Product availability at the time Recipient's Product Gift Order is placed. Reasonable efforts will be made to meet Recipient's Delivery requirements. Recipient will specify Ship To addresses within the country where the order is placed.

3. SHIPMENT AND RISK OF LOSS

   Products will ship according to standard commercial practice. Title and risk of loss and damage will pass to Recipient at the Ship To address.

4. INSTALLATION AND ACCEPTANCE

   a) Product installation information is available with Products if specifically itemized on the Product Gift Order. Installation, when included, is complete when the Product passes applicable installation and test procedures.

   b) For Products with installation included, acceptance by Recipient occurs upon completion of installation. For Products without installation included in the gift, acceptance by Recipient occurs upon Delivery, and will be presumed unless Recipient demonstrates within fourteen days after Delivery that a Product does not pass applicable installation and test procedures.

   c) If Recipient schedules or delays installation by more than thirty days after Delivery, Recipient's acceptance of the Product(s) will occur on the 31st day after Delivery.
5. SUPPORT (If applicable)

a) Gifts of or orders for Support are subject to the terms of the Support Exhibit or quotation in effect on the date of the Product Gift Order.

b) To be eligible for Support, Products must be at current specified revision levels and in good operating condition.

c) The Manufacturer may, at no additional charge, modify Products to (i) improve operation, supportability, or reliability, or (ii) meet legal requirements.

d) Relocation of Products is Recipient's responsibility. Relocation may result in additional Support charges and modified service response times. Support for Products moved to another country is subject to availability.

e) Each Manufacturer of a Product is responsible for providing Support. A Manufacturer will not be obligated to provide Support for Products not supplied by such Manufacturer or approved by such Manufacturer in writing, or for Products which Recipient does not allow such Manufacturer to modify.

f) Support does not cover any damage or failure caused by (i) use of media, supplies, or other products not listed in the Product Gift Order, (ii) site conditions that do not conform to Specifications, or (iii) neglect, improper use, casualty, power disturbances, transportation by Recipient, work or modification by people other than authorized employees or subcontractors, or other causes beyond the control of the Manufacturer.

g) Recipient is responsible for maintaining a procedure external to the Products to reconstruct lost or altered Recipient files, data or programs. Recipient will have a representative present when any Manufacturer provides Support services at Recipient's site. Recipient will notify the Manufacturer if Products are being used in an environment which poses a potential health hazard to employees or subcontractors providing Support; the Manufacturer may require Recipient to maintain such Products under the Manufacturer's supervision.

h) Recipient may delete Products under Support or cancel Support orders upon thirty days written notice. Upon sixty days written notice, a Manufacturer may cancel Support orders or delete Products no longer included in the Manufacturer's Support offering.

i) If training classes or consulting services are included in the Product Gift Order, they shall be completed no later than ninety days from the Delivery date unless a revised date is mutually agreed upon by Recipient and the Manufacturer. Training classes shall be at a location prescribed by the Manufacturer and do not include housing, transportation or other expenses.

6. WARRANTY

Products are covered by the Manufacturer's standard limited warranty for new products. Nothing in the Product Gift Order or in these Terms and Conditions of Gift shall be deemed to affect such warranty. Product warranty information is available with Products. The warranty period begins on the later of the date of Delivery or the date of installation if installed pursuant to the Product Gift Order. If Recipient schedules or delays installation more than thirty days after Delivery, warranty begins on the 31st day after Delivery.

7. LICENSES

Software is licensed to Recipient pursuant to the license that accompanies the Software. Nothing in the Product Gift Order or in these Terms and Conditions of Gift shall be deemed to affect such license.

8. INTELLECTUAL PROPERTY RIGHTS

a) The Manufacturer will defend or settle any claim against Recipient that Products or Support, delivered under these Terms and Conditions of Gift infringe any Intellectual Property Right in the country where Products are delivered to Recipient, provided that Recipient (i) was not at fault, (ii) promptly notifies the Manufacturer in writing of the claim, and (iii) cooperates with the Manufacturer in, and grants the Manufacturer sole control of, the defense or settlement of the claim.

b) The Manufacturer will pay infringement claim defense costs, settlement amounts and court-awarded damages. If such a claim appears likely to affect Recipient’s use of a Product, the Manufacturer may
modify the Product, procure any necessary license, or replace it.

c) The Manufacturer has no obligation for any claim of infringement arising from (i) compliance with any designs, specifications or instructions of the Recipient, (ii) Product modifications by Recipient or a third party, (iii) Product use prohibited by Specifications or related application notes, or (iv) use of the Product with products not listed in the Product Gift Order.

d) This section 8 states each Manufacturer’s entire liability for claims of infringement of Intellectual Property Rights.

9. LIMITATION OF AND LIABILITY AND REMEDIES

a) Products are not specifically designed, manufactured or intended for sale as parts, components or assemblies for the planning, construction, maintenance, or direct operation of a nuclear facility. Recipient is solely responsible and liable, and waives all claims against each Manufacturer, if Products or Support received by Recipient are used for these applications.

b) To the extent any Manufacturer is held legally liable to Recipient, the Manufacturer’s liability is limited to (i) payments described in section 8 above, (ii) damages for bodily injury, and, (iii) direct damages to tangible property up to a limit of U.S. $1,000,000.

c) In no event will any Manufacturer or its affiliates, subcontractors or suppliers be liable for any of the following (i) actual loss or direct damage that is not listed in section 9 b) above, (ii) damages for loss of data or software restoration, (iii) damages relating to Recipient's procurement of substitute products or services (i.e., "cost of cover"), or (iv) incidental, special, indirect, or consequential damages (including downtime costs or lost profits).

d) THE REMEDIES IN THESE TERMS AND CONDITIONS OF GIFT ARE RECIPIENT’S SOLE AND EXCLUSIVE REMEDIES.

10. GENERAL

a) Transactions may be conducted through Electronic Data Interchange ("EDI") or other electronic methods, as agreed.

b) A Manufacturer will not be liable for performance delays or for non-performance, due to causes beyond its reasonable control.

c) Recipient may not assign any rights or obligations under the Product Gift Order.

d) Recipient will comply with all applicable laws and regulations related to its use of Products and Software, including export and privacy laws and regulations, and shall obtain required export and import authorizations.

e) Disputes arising in connection with these Terms and Conditions of Gift will be governed by the laws of the State of California, U.S.A.

f) These Terms and Conditions of Gift and any Exhibits constitute the entire agreement between each Manufacturer and Recipient, and supersede any previous communications, representations, understandings, or agreements between the parties, whether oral or written, regarding transactions hereunder. Recipient's additional or different terms and conditions will not apply. Recipient's receipt or use of Products and Support will constitute Recipient's acceptance of these Terms and Conditions of Gift. The Terms and Conditions of Gift may not be changed except by an amendment signed by an authorized representative of HP and Recipient.