1. Name of the Proposed Center/Institute.

   Institute for Research in Intelligent Systems (IRIS)

2. Names.

   a. Name of the unit overseeing the Center/Institute.

      College of Engineering, Computer Science, and Construction Management

   b. Name, title, and rank of the individual(s) primarily responsible for drafting the proposal.

      Dr. Benjoe A. Juliano, Associate Professor, Computer Science
      Dr. Reneé S. Renner, Associate Professor, Computer Science
      Dr. Ramesh Varahamurti, Professor, Mechanical Engineering, Mechatronic
                Engineering, and Manufacturing Technology

3. Description of Center/Institute.

a. Contact Person or office (with phone, email, web address) responsible for the Center/Institute.

> Dr. Benjoe A. Juliano, Associate Professor, Computer Science
> Tel. 530 898-4619
> Fax. 530 898-5995
> Email: Juliano@csuChico.edu
> URL: http://www.ecst.csuchico.edu/~juliano

b. Goals and Purpose of Center/Institute and its relationship to University's organizational and policy structures.

> The ***Institute for Research in Intelligent Systems*** (IRIS) would oversee the College of Engineering, Computer Science, and Construction Management's (ECC) Intelligent Systems Laboratory (ISL). In particular, IRIS handles policies and management issues pertaining to the ISL. IRIS shall also serve as an advocate for education, research, and outreach projects related to the ISL and its mission.
>
> **MISSION:** Leading – within the CSU System – in the discovery, development, analysis, and integration of accessible intelligent systems research and technologies (e.g. autonomous robotics applications) for use in the community and the industry.
>
> **VISION:** To provide high-quality regional, national, and international research and instructional services in intelligent systems design, analysis, and implementation.
>
> **OBJECTIVES:**
>
> -   manage the use of the ISL and all equipment under the jurisdiction of the ISL (i.e. all instrumentation and equipment secured through ISL-related contracts and grants);
> -   foster collaborative work within the College of ECC;
> -   assist in forming partnerships for funded projects within campus, with regional industries, federal, state, and local agencies;
> -   serve as a liaison to constituents when opportunities arise to use the ISL as a resource for instruction or research;
> -   outreach and recruitment for the ISL and related majors;
> -   oversight of camps, seminars, workshops, and curriculum decisions related to ISL and its mission;

- provide a venue for mentoring and guiding student projects for competitions;

- provide a venue for assisting in funding and travel opportunities for competitions and conferences;

- dissemination of ISL-related news and activities.

c. Need for the Center/Institute and its relationship to the University's Strategic Plan.

IRIS's ultimate goal is to develop the university's role as a recognized leader in research and instructional services in intelligent systems design, analysis, and implementation.

Undergraduate Education	Graduate Education	Research and Scholarship	Outreach
Goal 1: Ensure a quality undergraduate educational experience by effectively integrating hands-on learning of the design, analysis, and implementation of intelligent systems.	**Goal 2:** Ensure a quality graduate educational experience by effectively integrating hands-on learning of the design, analysis, and implementation of intelligent systems.	**Goal 3:** Enhance the stature of CSUC as a nationally recognized university through quality research and partnerships in intelligent systems design, analysis, and implementation.	**Goal 4:** Enhance CSUC's ability to transfer intelligent systems knowledge and expertise to society and to provide quality learning opportunities to the surrounding community, residents and industry partners in the Pacific Northwest.
Strategic Plan for the Future of CSUC, Priority #1: "Believing in the primacy of student learning, we will continue to develop high quality learning environments both in and outside of the classroom."	*Strategic Plan for the Future of CSUC, Priority #1:* "Believing in the primacy of student learning, we will continue to develop high quality learning environments both in and outside of the classroom."	*Strategic Plan for the Future of CSUC, Priority #2:* "Believing in the importance of faculty and staff, and their role in student success, we will continue to invest in faculty and staff development."	*Strategic Plan for the Future of CSUC, Priority #4:* "Believing in the value of service to others, we will continue to serve the educational, cultural, and economic needs of Northern California."

Undergraduate Education	Graduate Education	Research and Scholarship	Outreach
Objective 1.1: Increase the variety of pedagogical experiences for undergraduate students interested in intelligent systems by fostering hands-on learning and team experiences.	Objective 2.1: Increase the variety of pedagogical experiences for graduate students interested in intelligent systems by fostering hands-on learning and interdisciplinary research collaborations.	Objective 3.1: Increase engagement in scholarly activities that promote Chico State's stature in intelligent systems design, analysis, and implementation.	Objective 4.1: Engage business and industry, government and nonprofit organizations in Chico State's intelligent systems activities by providing programs and services that meet their training, education and research needs, and improve their effectiveness and competitiveness.
Objective 1.2: Provide faculty with instructional models, techniques, and tools for teaching about intelligent systems.	Objective 2.2: Provide faculty with instructional models, techniques, and tools for promoting research on intelligent systems.	Objective 3.2: Increase sponsored research funding through partnerships with faculty through grant writing targeted to intelligent systems design, analysis, and implementation.	Objective 4.2: Nurture role as a University liaison to constituents, the community, and business partners when opportunities arise to use the ISL as a resource for instruction or research.
Objective 1.3: Support efforts to increase the diversity of the student body by fostering interdisciplinary collaborations and student competitions.	Objective 2.3: Foster collaboration between colleges to identify and develop collaborative research opportunities for graduate students.	Objective 3.3: Support faculty, students, and departments through the development and dissemination of collaborative activities.	Objective 4.3: Foster outreach programs that encourage collaboration through healthy partnerships between University constituents, the community, and business partners.

d. Governing structure for the Center/Institute.

   i. Board Membership

     (a) Permanent:

       Three (3) permanent tenure/tenure-track faculty from the College of Engineering, Computer Science, and Construction Management

     (b) Adjunct (two-year staggered terms):

       Two (2) Chico State faculty

     (c) Student (non-voting, one-year term):

       One (1) full-time, currently registered Chico State student

   ii. Board Membership Requirements

The IRIS Board shall always consist of a majority of faculty from the College of ECC. Board members are expected to adhere to *Professional Ethics and Standards* as outlined in FPPP 2.0 through 2.4, and to be aware of the University's stand on *Misconduct in Research* as outlined in FPPP 26.0. Board members involved in temporary suspensions[1], reprimands[2], disciplinary actions[3], or grievances[4] against them may result in removal from the Board. Such action will be in consultation with the Dean of the College of ECC and the rest of the Board.

The Board will guide the direction of IRIS in terms of education, research, and outreach activities. In particular, Board members will actively pursue external contracts and grants to support various IRIS-related activities. The Board will submit an *Annual Report* to the Dean of the College of ECC for distribution to university constituents, the community, and industry partners.

   iii. Board Membership Selection Criteria

     (a) Permanent members

The three permanent faculty from the College of ECC will initially consist of the three (3) PIs (see item 2b above). Permanent members of the Board are replaced only if they resign their position, leave the College of ECC, or are otherwise removed from the Board based on misconduct or violation of the FPPP. Replacements are determined by the Board, in consultation with the Dean.

1 See FPPP Section 23.0 or CBA Article 17 on Temporary Suspension.
2 See FPPP Section 24.0 or CBA Article 18 on Reprimands.
3 See FPPP Section 25.0 or CBA Article 19 on Disciplinary Actions.
4 See FPPP Section 27.0 or CBA Article 10 on Grievances.

Selection criteria include

- have considerable and varied intelligent systems experience either through a proven track record teaching courses related to intelligent systems, conducting research or publishing under the umbrella of intelligent systems, or through experience working with private industry or public agencies.

- have demonstrated interest and ability in furthering their knowledge in intelligent systems, and have evidenced enthusiasm for the professional aspects and growth of intelligent systems design, analysis, and implementation.
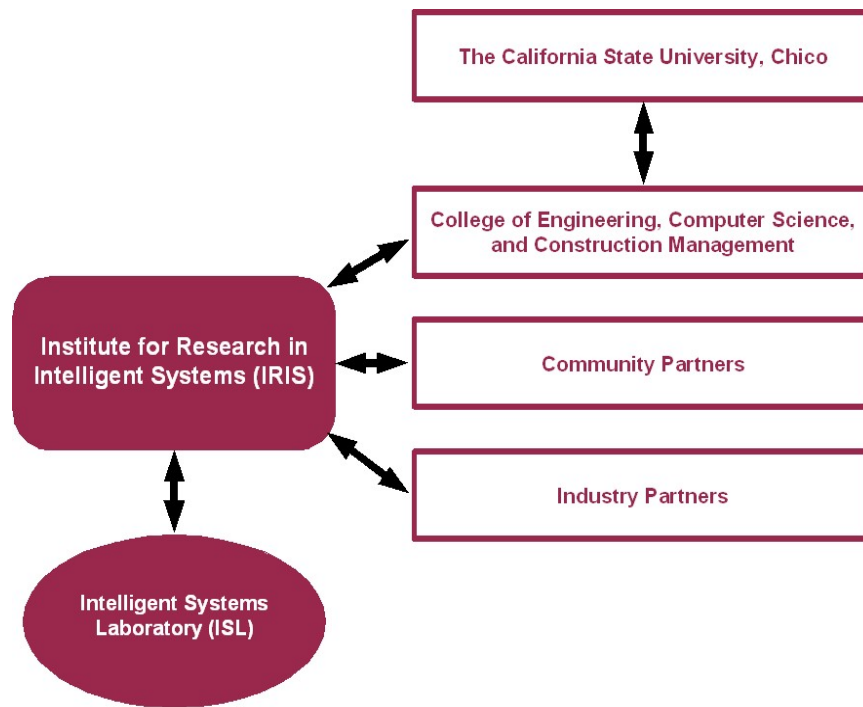
(b) Director

The Director of IRIS is appointed by the permanent members of the Board for a three-year term.

Selection criteria include

- permanent member of the Board that is a tenured faculty.
- proven track record in successful grant writing an asset.

- should have demonstrated the capacity to make decisions and to pursue them to conclusion.
- should have demonstrated administrative ability, both academic and professional, in directing personnel or research projects.

(c) Adjunct members

The adjunct faculty members of the Board are positions invited and voted in by the three (3) permanent members. Each of these two positions has a staggered two-year term, with one position starting initially as a one-year term.

Selection criteria include, but are not limited to

- demonstrated interest in intelligent systems and contributing to the mission of IRIS.
- possess a unique interdisciplinary contribution.

(d) Student member

A student member will be appointed by the Board for a one-year term.

Selection criteria include, but are not limited to

- full-time, currently registered with at least junior standing at time of appointment
- demonstrated interest in intelligent systems and contributing to the mission of IRIS.

4. Expected impact on curriculum development/delivery and professional development opportunities.

IRIS will not be directly involved in curriculum decisions or development matters that directly affect academic programs in the College of ECC. However, IRIS is expected to have a positive indirect effect on curriculum and educational matters, by facilitating the use of ISL robotics equipment for classroom use, events, and demonstrations. Additionally, IRIS will coordinate intelligent systems seminars or workshops upon request, which may be delivered to students, faculty, or the community. Furthermore, faculty in the college will be provided opportunities to join project groups within the institute, and/or serve in an advisory capacity on such projects, furthering professional development opportunities of faculty and students through research.

As a priority of the institute, professional development opportunities will be made available to both graduate and undergraduate students in the form of ISL research assistantships, whenever funds are available. Research experience is expected to have a strong positive influence on post-graduate career placement of student members. At

least one graduate student has already benefited by research experience in the ISL, landing an R&D position at a prominent government laboratory, while at least two more ISL student members are currently planning to apply to doctoral programs within the year.

IRIS will continue to promote collaborative research projects that facilitate multi-disciplinary work between faculty and students. Access to intelligent systems research equipment will support professional development endeavors for faculty and students.

5. Place in Strategic Plan of unit having authority over center or institute and expected impact on resources, curriculum development and professional development.

"The Mission of the College [of Engineering, Computer Science, and Construction Management] is to provide engineering, computer science, and technology students with a strong, broad based education that will provide them with the knowledge and skills to be successful practitioners, and empower them to continue their education at the graduate level and cultivate a lifetime of learning. The College mission is also to support the success of its various programs, as articulated through their respective missions and objectives." IRIS's mission, vision, and objectives (see item 3b above) have been constructed to support the mission of the College of ECC. The expected impact of the institute on the College is

   i.   resources – no significant impact on college resources is expected. The center will operate out of the ISL workspace in OCNL, with continued charge of that space and shared access to computer lab facilities. As demonstrated over the previous three years of the ISL NSF equipment grant, the center will facilitate the acquisition and availability of intelligent systems equipment, supplies, and personnel for use in education, research, and outreach activities.

   ii. curriculum development – outside of recommendations for intelligent systems curriculum enhancement, the impact on curriculum will be limited, as this only pertains to non-credit seminars and workshops provided by IRIS.

   iii. professional development – enhanced opportunities for faculty and students. It will remain a priority for IRIS to acquire external funding for student research assistantships and faculty buy-outs. Similarly, external funds will be secured and made available to support project equipment/supply needs, publication fees, and travel to competitions and professional presentations.

6. Funding:

    a. How much funding will be necessary?

Because the ISL lab is already in place from the NSF equipment grant, the center can operate for periods of time on minimal or no funds, if necessary. This can be accomplished through volunteer efforts and donations, following the model set in place over the last three years. However, the effectiveness of the center will be much less than periods when funding is acquired. To operate at the current level, which includes several outreach activities, four student assistantships, funds for supplies and equipment upgrades, and ongoing student projects, the center would need to acquire approximately $40K/yr. To operate at an optimal level where research is fostered, faculty buyout to pursue research projects outside of the classroom and travel funds for competitions and presentations would be necessary, bringing the desired annual funding needs to approximately $140K/yr.

    b. How will funding be obtained and sustained?

While no internal funding is expected, external funding will be sought to enhance the mission of the center. The board members will actively pursue external contracts and grants to maintain the center and its efforts.

Current NSF funding is sufficient to support at least two graduate and two undergraduate student research assistants each semester. Student support through research assistantships was made possible by allotting 35% of the grant award for student stipends. The PIs plan to sustain such student support through NSF and similar grant agencies.

The IRIS management team (which consists of the PIs) are currently nonsalaried positions; the PIs did not request for funding for faculty release time or summer pay because the NSF MRI/RUI guidelines do not provide for such funding. Hence, noncontinuous external funding would not greatly affect management of IRIS or the ISL. Although, without funding for faculty release time, the opportunities for faculty research and professional development are limited.

For the past two summers, a Summer Robotics Camp for Junior High Girls has been provided free for up to thirty girls. The camp has been quite successful. Board members will actively pursue grant writing, contracts opportunities with industry, donations, and other creative approaches toward offerings of workshops, seminars, and camps, in order to assist IRIS in being self-sustaining while still offering quality events in classroom assistance, outreach, and research. When possible, supplemental funding from the College, various departments, or industry partners may be obtained to assist in outreach or professional development opportunities, such as offering of lunches, printing costs, and modest travel funds.

   c. How will funding serve to provide:

      i. Equipment (List new equipment needed, and amount and source of funds.)

        Secured through external contracts and grants. The amount of funds necessary to sustain the current level of activity is foreseen to be limited to hardware and software upgrades and occasional purchase of a new platform. This should be less than $10K/yr. Anything beyond that would be in the form of a donation.

     ii. Supplies (List new supplies needed, and amount and source of funds.)

        Primarily secured through external contracts and grants. Funding for supplies geared for the Annual Summer Robotics Camp (printing costs, T-shirts, lunches/snacks, etc.) and other outreach activities may come from various constituents of the College of ECC and/or community partners.

    iii. Staff (List faculty and staff members who will be involved and how the time needed for Staff will be made available.)

        Secured through external contracts and grants. Limited staff/systems support will be secured as funds become available. Faculty members may secure release time through course buyouts if the appropriate external contract or grant allows for such arrangements.

    iv. Library needs (List periodicals and books required to support Institute or Center and estimate costs.)

        Continued access to online journals, through existing library acquisitions.

7. List all other university entities that cover any significant part of the goals and objectives of the planned Center/Institute. If there is any duplication, explain why it is necessary. Include statements from areas of duplication.

There are no other university entities that cover any significant part of the goals and objectives of IRIS. However, there are research initiatives like the Agriculture Research Initiative (ARI) that facilitate intelligent systems research projects that relate to the goals and objectives of IRIS.

IRIS will enhance the infrastructure for research within the College of ECC by facilitating collaboration with other institutes and centers within the College like (1) the Center for Manufacturing Excellence, (2) the IBM Corporation Networks Laboratory, and (3) the McLeod Institute of Simulation Sciences. Likewise, IRIS will facilitate collaboration with other institutes and centers within and around the Chico State campus.

8. Explain how the new Center/Institute meets the CSU Executive Order 751 definition of a center, institute, or similar entity. If it does not meet the definition, then state why the new Center/Institute does not need to be reported to the Chancellor's Office.

IRIS will offer non-credit instruction (through seminars and workshops), provide informative demonstrations, and other outreach services within the campus community and to public or private agencies or individuals. One such outreach activity is the annual Summer Robotics Camp for Junior High Girls that aims to recruit (underrepresented) females into the mathematical sciences and engineering fields. IRIS will provide special intelligent systems training to faculty and students involved in various projects that require robotics equipment from the ISL.

IRIS will coordinate dissemination of results and progress with ISL-related projects and research through appropriate conference Proceedings and other peer-reviewed publications, as well as through the IRIS and ISL websites[1]. The IRIS and ISL websites will facilitate online access to electronic versions of publications, reports, and presentations, including a list of projects, contacts, details of various outreach activities, and other related information.

IRIS education, research, and outreach activities will contribute to the fulfillment of mission and goals of the California State University and the Chico State campus.

---

1   The ISL website is at http://www.gotbots.org and the IRIS website is at http://iris.ecst.csuchico.edu.