Spring 2019 Undergrad/Graduate 199/299 Research Opportunities

The California Institute for Telecommunications and Information Technology (Calit2) at UC Irvine is seeking student innovators for cutting-edge, industry focused engineering, art/technology interface, computer science research in energy efficiency, micro-nanofabrication, and gamification research areas.

More than 200 UCI faculty and students are actively engaged in Calit2, INRF/BION (clean rooms) and CalPlug (a division of Calit2) research on environmental, transportation, energy management, health care, education and entertainment-based projects.

APPLICATION PROCESS AND REQUIREMENTS

Motivated applicants are welcome to apply and attend the orientation. Please follow these procedures to apply:

“Introducing Calit2/CalPlug”
3008 Calit2 Building
Irvine, CA. 92697-2800
Wednesday, April 3rd 4-5 pm

1. Students may only receive 199/299 credit for the first quarter of research with CalPlug. No paid positions are available to new research students unless otherwise stated. Paid positions will be offered only if funding is available and to students showing high caliber research with need.

2. GPAs >3.0 are strongly desired. Students applying with lower GPAs must explain extenuating circumstances and show maintained academic improvement to be considered.

3. Students must be prepared to dedicate a minimum of 1 year (3 quarters) to research at time of application. Except in special circumstances, students with less than 5 quarters remaining ahead of graduation are ineligible from joining Calit2/CalPlug projects. Too little time remains at this point to become deeply involved in the projects.

4. Submit a one-page resume along with unofficial academic transcript and introductory letter to the Administrative Team at research@calit2.uci.edu, AND please copy (CC) appropriate mentor for the project(s) you are interested in: (Gago-) Professor Sergio Gago (sgagomas@uci.edu), (Klo-) Dr. Michael Klopfer (mklopfier@uci.edu), (Don-) Dr. Richard Donovan (rpdonova@uci.edu) and (INRF-) Steven Martinez (stevenm4@uci.edu). Please discuss projects of interest (including position ID) in the reply email. This must be done BEFORE Friday, April 5th to allow time for interviews and processing to meet the school’s enrollment deadline of Friday, April 12th. DO NOT REGISTER IF YOU ARE NOT ASSIGNED ON A TEAM.
5. Selected students will be contacted to schedule an interview. Interviews will focus on student ability, interest, availability, and project matching. Project scheduling will follow the interview.
6. Students are expected to work a minimum of 8 hours per week on research (equivalent to 2 units).
7. Students are expected to work in professional, interdisciplinary teams.
8. Students are strictly held to unit-hour requirements (4 hours/week per unit). Substantial unexcused divergence from the required time will result in an incomplete or fail grade.
9. Students are required to submit a summary report for the work performed each quarter if required by research mentor.
10. No more than 1/3 of research work can be performed offsite from Calit2. Students must be present to gain personal and team development.
11. When required by research mentor, students will keep timesheets and work logs during projects. Research notebooks will be maintained. A quarter-end written report is required from all 199/299 students. Reports and presentations will be used to assess grades.

BENEFITS

- Students will obtain hands-on research experiences for industry leading topics under Professor G.P. Li. Day-to-day supervision will be available from project leaders at Calit2/INRF/ETAD and/or CalPlug.
- Students work to build maker skills while gaining practical career experience.
- In addition to 199/299 course credits during the first quarter of research, students who maintain outstanding research performance will be considered for potential compensation as funded projects become available.
- Designated cubicles, project space, project supplies, test equipment, and computers will be provided to students according to project needs.
- Recommendation letters provided to exemplary students are valuable thanks to Calit2’s strong affiliation with major organizations and industry players and other UC schools and campuses (Ex: California Energy Commission, Southern California Edison, Microsemi Corporation, and the Consumer Technology Association). More than 2 quarters of work is required to be potentially eligible for a recommendation letter. Students must present a case of impressive work completed.
- Students will develop hard as well as soft skills required for the 21st Century workforce. We seek to establish and promote students into high quality engineers and leaders. Impressive project portfolios with solid, real-world achievements are commonly the result of conducting research at Calit2.
POSITIONS

We are calling for a talented group of students from engineering and computer science departments (EE/CSE/ICS/MAE/BME and others), Social Sciences, Social Ecology, Physical Sciences, Business as well as the Schools of Arts and Humanities to join our team. Diversity is a must for creativity. Current projects are listed below.

Position ID: Gago-Spr1901
Project: PICARD
Research field: Telemedicine/Health/ PICARD
Main Tasks: Patient-Initiated Controlled Analgesic Recording Dispenser developers envision creating an ecosystem that will ensure prescription opioid drugs are correctly dispensed to a patient while tracking a drug’s use and effectiveness. User Interface Design and implementation/This team mainly focuses on designing an elegant user interface for hardware system interfacing and controlling running Linux on Raspberry Pi.
Preferred but not required skills: Java, JavaScript, Node JS, Express, QT, Git.
PICARD Teams*: 1. Electrical; 2. Mechanical; 3. Software; 4. AI
*Recruiting for only Electrical and Mechanical teams. No positions available on Software or AI.

Position ID: Gago-SprNA
Project: FOOD SMART
Research field: Health & Wellness
Main Tasks: Research on Food Waste, Food Insecurity and Food Gaps. Develop website as well as app to inform and address the food issues facing us domestically and globally.
Preferred but not required skills: HTML, CSS, Javascript, Java, Swift Cordova, Git.
FS Teams*: 1. Web; 2. App
**Please check back in the Fall Quarter 2019 for availability

Position ID: Gago-SprNA
Project: VR LAB TUTOR
Research field: Virtual reality
Main Tasks: to create simple-to-understand VR tutorials for laboratory equipment.
Preferred skills: C# programming, Unity, Unity VR, PiXYZ and/or any other VR experience as well as UI/UX 3-D design.
**Please check back in the Fall Quarter 2019 for availability

www.calit2.uci.edu  TELE: (949) 824-6900  research@calit2.uci.edu
**Position ID: Gago-Spr1904**

**Project: VR K-12**  
Research field: Virtual reality  
Main Tasks: to create VR content for educational purposes for the K-12 group.  
Preferred skills: C# programming, Unity, Unity VR and/or any other VR experience as well as 3D modeling (Maya or Blender) and UI/UX 3-D design.

**Recruiting for 6 team members**

**Position ID: Gago-SprNA**

**Project: PET**  
Research field: Health/Medical/Education  
Main Tasks: Personal Embodied Trainers may provide two important advantages when added to conventional or digital systems to promote physical therapies: (1) Providing an animated biped model as an interface to represent exercises to be mimicked by the user, and (2) delivering verbal and nonverbal communication (e.g. intonation, mood and facial expression) to improve communication, enjoyment and build a social bond that may drive the user’s attitude towards a particular goal, for instance, training harder or for longer periods.  
Preferred skills: Android development, Java, MongoDB, JSON

**Please check back in the Fall Quarter 2019 for availability**

**Position ID: Klo-Spr1901**

**Smartenit IoT interface**  
Students will develop home automation solutions and should have some background in the Python programming language, developing front ends using Angular, and experience with SQL or Mongo Database. This project will involve interfacing Amazon’s Alexa or Google Home to perform advanced control of plug load devices. Development of user interfaces using JS/Angular (web) or Python/QT/TCL for applications - multiple opportunities across multiple sub-projects.  
Skills Required: Python, Angular, SQL or Mongo Database

**Recruiting for up to 2 team members**
**Position ID: Klo-Spr1902**

**Project SIM Test**
Looking for students with some Labview or data acquisition experience to assist with a project for a major utility to understand home energy usage. Students will develop and evaluate testing approaches in a laboratory environment. Students will both develop measurement approaches and perform testing experiments.

**Preferred skills:** Labview, MatLAB

**Recruiting for up to 2 team members**

---

**Position ID: Klo-Spr1903**

**Embedded Development**
Looking for students with experience in circuit design to assist with the development of sensor applications including our array of smart appliances in the “buddy” series. Participating students should have knowledge with microcontroller-based design projects and experience interfacing microcontrollers to sensors.

**Preferred skills:** Autodesk Eagle, general analog/digital circuit design, Embedded C/C++/Arduino.

**Recruiting for up to 2 team members.**

---

**Position ID: Klo-Spr1904**

**Project FPGA - Field Programmable Gate Arrays**
Students will develop high speed data acquisition modules, should have some experience programming with VHDL or Verilog and experience loading to physical FPGA boards and test with interfaced peripherals. This is a great project for students with some physical FPGA experience who want to take their skills to the next level.

**Preferred skills:** Experience with VHDL/Verilog AND some experience with physical hardware programming, circuit design, bread-boarding.

**Recruiting for up to 2 team members.**
**Position ID: DETT (Data Engineering ThinkTank!)**

**Research Field:** Distributed edge computing for machine learning in advanced manufacturing contexts

**Main Tasks:** Programming edge devices to solve distributed computing problems for advanced manufacturing. This project will focus on creating edge computing platforms through which Google open source cluster management software, Kubernetes, Docker and machine learning libraries e.g. (TensorFlow) will be used to manage resources for distributed computing with mobile edge devices. A portable cluster is lightweight and flexible to environmental conditions found in many advanced manufacturing fields. These systems are useful for pushing decision making out to network edge for fast robust adaptive control of complex processes. Students will conduct research on creating useful OS configurations for various clusters such that a compute node resource can be easily joined and removed locally within a wifi network, as well as through multiple routers in the network. Dockers and Kubernetes will be used to manage compute resources and applications.

**Preferred skills:** Unix/Linux shell programming, Matlab, Mathematica or similar programming experience. In addition, experience with CAD/CAM/CAE software for mechanical design and numerical modeling (e.g. Autocad, ANSYS, and similar) would be helpful.

**Please check back in the Fall Quarter 2019 for availability.**

---

**Position ID: INRF - NO POSITIONS AVAILABLE FOR SPRING 2019**

**Research Field:** Nanotechnology / Semiconductor / Process & Equipment Engineering

**Main Tasks:** Develop and benchmark baseline processes for the INRF/BiON cleanroom lab processes and equipment, design and implement fabrication experiments and process controls, monitor and work to optimize fabrication process techniques. Prior knowledge of nanotechnology, semiconductor processes, SPC, and/or cleanroom lab operations a plus but none is required.

**Please check back in the Fall Quarter 2019 for availability.**