



CORE SEED FUNDING OPPORTUNITIES

CITRIS and the Banatao Institute Core Seed Funding Opportunities for 2018

Deadline: Friday, January 26, 2018 at 5:00 PM (PST)

Weblink: <http://citris-uc.org/core-seed-funding/>

Questions: seeds@citris-uc.org

CITRIS and the Banatao Institute (<http://citris-uc.org>) create information technology solutions for society's most pressing challenges. Established in 2001, the Center for Information Technology Research in the Interest of Society (CITRIS) leverages the interdisciplinary research strengths of multiple UC campuses to advance the University of California's mission and the innovative spirit of California. The institute was created to shorten the pipeline between world-class laboratory research and the development of cutting-edge applications, platforms, companies, and even new industries.

We invite Principal Investigators at UC Berkeley, UC Davis, UC Davis Health, UC Merced, and UC Santa Cruz to apply for seed funding that furthers CITRIS and the Banatao Institute research initiatives (<http://citris-uc.org/core-initiatives>) strengthens connections among UC campuses, and catalyzes early-stage research that can lead to external funding.

Funded projects have attracted follow-on support from federal, state, corporate, and private sources including the National Science Foundation, National Institutes of Health, Intel, Microsoft, Mellon Foundation, and the Bill & Melinda Gates Foundation.

View descriptions of prior awardees and projects: <http://citris-uc.org/core-seed-funding/#past-awards>.

| | 2018 Core CITRIS Seed Funding |
|---|---|
| Area(s) of Interest | Connected Communities Health People and Robots Sustainable Infrastructures |
| Total funds available | \$550,000 |
| Project amount | Up to \$60,000 |
| Eligibility | All applicants must have Principal Investigator (or exceptional PI) status on their campus. |
| <i>CITRIS Campuses:</i> UC Berkeley UC Davis UC Davis Health UC Merced UC Santa Cruz | At least 2 PIs. Each from a different CITRIS campus. |

Timeline

- **October 12, 2017:** Call for 2018 CITRIS and the Banatao Institute Seed Fund proposals will be announced online. CITRIS Newsletter (<http://bit.ly/SubscribeCITRIS>) and seed funding interest list (<http://bit.ly/CITRISSeedInfo>) subscribers will receive the RFP information by email.
- **October/November 2017:** Each CITRIS campus will host an information session for potential applicants. Dates and details will be posted here and email to CITRIS newsletter subscribers.
- **October 2017-January 2018:** Matchmaking and multi-campus team formation occurs among Principal Investigators. Contact us at seeds@citris-uc.org for assistance with finding compatible co-PIs.
- **November 30, 2017:** Online application portal will open for submissions at <https://citris-uc.fluidreview.com>.

- **January 26, 2018 at 5:00pm PST: Applications are due online.**
- **March 1, 2018:** Applicants who received a Seed Fund Award in 2017 must submit a preliminary report on findings and results in order to be considered for a Seed Fund Award in 2018.
- **Mid-March 2018:** Awardees are notified.
- **April 1, 2018:** Performance period begins for 2018 Seed Funded projects.
- **June 30, 2018:** Final reports for 2017 Seed Funded projects are due.

Eligibility and Proposal Requirements

For the core CITRIS and the Banatao Institute Seed Funding opportunity:

- To encourage multi-campus collaboration, each proposal must include at least two Principal Investigators, from at least two different CITRIS campuses: UC Berkeley, UC Davis, UC Merced, UC Santa Cruz.
- Collaborations between PIs on the main UC Davis campus and the UC Davis Health fulfill the above requirement.
- Projects are expected to further one or more of the CITRIS and the Banatao Institute Initiatives (<http://citrис-uc.org/core-initiatives>): Connected Communities, Health, People and Robots, Sustainable Infrastructures. Proposals that include applications of such technology in developing regions are welcome.
- Projects that use CITRIS research assets, such as the Marvell NanoLab (<http://citrис-uc.org/marvell-nanolab/>) and CITRIS Invention Lab (<http://invent.citrис-uc.org>), are also encouraged.

Exclusions

- CITRIS Seed Funding may not be used for faculty salary or non-resident tuition.
- Principal Investigators may participate in no more than two proposals per application cycle and serve as lead researcher on no more than one proposal per application cycle.
- Principal Investigators who have previously received seed funding must submit an online status report for the previous project(s) before being considered for a new CITRIS Seed Fund Award.

Evaluation Criteria

Seed Fund Award proposals are evaluated according to the following criteria:

1. **Feasibility:** Can the stated goals be achieved within 12-18 months?
2. **Creates solution to a societal challenge:** Is the societal problem and its scale clearly identified? Will the proposed project help to address this challenge?

3. **Potential for follow-on funding:** Has this area of research been identified by federal agencies or other funders as an area of future investment? Will the CITRIS Seed Fund Award help the investigators make a stronger case for future external funding?
4. **Alignment with CITRIS research initiatives and the charter of the Banatao Institute:** Does the proposal further one or more of the CITRIS interest areas described below? Proposals are also invited that further the goals of the newly chartered Banatao Institute (<http://citris-uc.org/the-banatao-institute/>) at CITRIS, which leverages University of California expertise and IT solutions for the benefit of developing regions in the U.S. and abroad.
5. **Use of CITRIS and the Banatao Institute research assets** including the Marvell NanoLab (<http://citris-uc.org/marvell-nanolab/>), CITRIS Invention Lab (<http://invent.citris-uc.org>), or other CITRIS-affiliated testbeds is encouraged but not required.
6. **Inclusion of pre-tenured faculty** is encouraged but not required.

Submission Instructions and Requirements

The CITRIS Seed Fund application portal is at <https://citris-uc.fluidreview.com>. You can easily submit and manage your applications online when the portal opens on November 30, 2017.

We suggest that the lead PI initiates the application for each proposal team. The co-PI(s) will then receive an automatic email link to log on and view or edit the joint proposal. To help you prepare, please have the following information ready to create or log in to your account and complete the online application:

- PI and co-PI name, campus, home department, link to CV
- Project Title
- Abstract (250 words max)
- Brief narrative (2-3 pages) What problem does the project address? What new technology will be developed? Will the project apply existing technology in a novel way? If successful, what would be the impact of the new technology or application? What qualifications do the team members offer to address the challenge?
- Budget narrative with allocation of funds between campuses (*paragraph*). Please include name and email of Research Administrator for each PI.
- Up to five references (*links*). These may refer to the challenge being addressed or to previous work that the PIs intend to build upon.
- Optional: upload a one-page .pdf or image file
- List of prior CITRIS Seed Fund awards: PI names, year, project title

CITRIS Seed Funding: 2018 Areas of Interest

1. Connected Communities
2. Health
3. People and Robots
4. Sustainable Infrastructures

1. CITRIS Connected Communities



The Connected Communities Initiative at CITRIS focuses on the affordances of information technology to enhance communities – of learning, of experience, of practice, and of governance. This initiative embraces the development of experimental online platforms and novel hardware and software systems that connect cohorts to each other and to institutions in meaningful and productive ways. Building on leadership expertise in human-computer interaction, user interface design, as well as political, social and economic development, the initiative supports projects in domains including education, human rights and migration, philanthropy, journalism, public health, citizen science, and ICT infrastructure and policy.



<http://connected-communities.citris-uc.org>

Proposals solicited under CITRIS Connected Communities include (but are not limited to):

- A. Applications that support **civic engagement or citizen science**. **Crowdsourcing systems** for applications including education, healthcare, ICT for development (ICT4D), sustainability, agriculture, transportation, or other domains.
- B. Platforms that support the **maker movement**, including innovative platforms for **remote collaboration and online education** (e.g., MOOCs, blended learning, informal and skill-based learning).
- C. Innovative use of **virtual reality/augmented reality (VR/AR)** applications for cultural heritage preservation, enhanced access to historical sites, increasing understanding and empathy for inclusion of diverse groups, and other applications.
- D. Applications for **public open data** and innovative use of **data visualization tools** especially those that support improved democracy, human rights, public discourse, and empowerment of precarious and underrepresented communities.
- E. Work that critically and intelligently addresses labor and socioeconomic development questions raised by **on-demand work** or the “sharing economy”.
- F. Applications that broaden **access and public participation** in technology and STEM/STEAM (Science, Technology, Engineering, Arts, Math) fields.

G. Platforms that address issues of **inclusivity, algorithmic bias, and media trust.**

2. CITRIS Health



CITRIS Health focuses on developing transformative, scalable, and sustainable IT innovations to improve health and wellness. These technology-enabled solutions aim to improve the quality of care and health outcomes, while reducing healthcare costs. Current priorities address the primary drivers affecting health, including chronic disease, aging, and health behavior. Interdisciplinary projects should build upon the principal technology solutions of telehealth, sensors, mobile, cloud, informatics, and/or data analytics, with an emphasis on solutions that combine hardware and software. CITRIS Health is particularly interested in cutting-edge proposals that will improve outcomes and services to persons with chronic disease at the patient, caregiver, provider, or system level as aligned with the aims of the thematic goals of Hospital to Home and Precision Health.

Accessible technologies for patients to monitor and provide data can be linked with clinical care to create new forms of precision health. These innovations have the potential to change the culture of healthcare and transform patients from passive recipients to active participants. Capabilities for healthcare practitioners to prescribe data for passive and active monitoring of patients will inform rich descriptions of patients' environmental lived experiences and improve management of chronic care and medication compliance, as well as functional health and wellness. New capabilities of patient data ownership may change the focus of the practice of medicine from clinic to community and spur new opportunities in large-scale community health research. Health care that engages patients as participants may generate enormous quantities of data that will require enhanced interaction between patients, providers, and payers as well as new forms of education for health practitioners in order to achieve the full benefits of precision health.



<http://health.citris-uc.org>

Proposals solicited under CITRIS Health include (but are not limited to):

- A. **Data analytics:** Integrating sensor networks and algorithms with clinical management and diagnostics; using Electronic Health Record data with patient-provided data for chronic disease modeling, population precision health visualization; diagnostic and monitoring software as a service solutions.
- B. **Care management solutions:** Models for chronic care management; evaluation and validation of human factors in chronic care; advances in patient and provider engagement and communication; services addressing access and disparities; innovative and sustainable telehealth programs; personalized nutrition and wellness.
- C. **New platforms and sensors:** Tele-immersion, 3D visualization, population epidemiology visualization, virtual reality/augmented reality, wireless, telehealth and mobile devices;

clinical and laboratory digital devices; passive and embedded sensors; interoperable systems; improvements in user interfaces.

- D. **Integrated wireless, mobile and app-based solutions:** Game-based learning; behavior-change programs; disease management solutions; social networking solutions for health improvement.
- E. **Technology solutions for aging and chronic disease:** Healthcare technology solutions for prevention, health promotion, and chronic disease management for older adults and persons with disabilities; innovative technology solutions for informal and formal caregivers.

3. CITRIS People and Robots



The CITRIS People and Robots (CPAR) initiative currently includes 75 affiliated faculty and focuses on research in AI and Robotics applications that enhance humans rather than replacing them. Innovations in sensors, devices, networks, optimization, and machine learning have potential to reduce drudgery and improve human experience in healthcare, agriculture, manufacturing, transportation, safety, and a broad range of other applications in the interests of society. Achieving this requires sensitivity to human factors, rigorous theory evaluated on standard benchmarks or in user studies, and modular systems built on shared software toolkits. Multidisciplinary research is needed to investigate the basic and applied science for design of human-interactive systems and robust performance, addressing the inherent uncertainty in sensing, modeling, and actuation used for control, learning, and systems identification. This is particularly acute for non-convex, non-stationary, distributed, and heterogeneous systems operating with noisy sensors in the physical world that work with, around, and in support of humans. Recent developments in sequential non-convex optimization, model predictive control, and Reinforcement Learning hold promise for addressing these problems at scale.

 <http://robotics.citris-uc.org>

The CITRIS People and Robots (CPAR) initiative requests proposals for cutting-edge, innovative, cross-campus projects related to the above topics and applications as well as:

- A. **Human-Centric Automation:** New models, metrics, and algorithms for Human-Robot Interaction (HRI) and methods that incorporate humans into the learning and control loop.
- B. **Bio-Inspired Robotics:** New approaches, experiments, and hardware inspired by biological systems such as gecko-inspired adhesives or cockroach-inspired mobile and agile robots.
- C. **Deep Learning:** In the past year, Deep Learning has yielded surprising results in the Artificial Intelligence subfields of computer vision and speech recognition. Applying these ideas to Robotics will address challenges such as coping with time series, exploration, and credit assignment under delayed rewards.

- D. **Cloud Robotics:** Cloud Computing and Distributed Memory can provide access to large datasets and clusters of remote processors to filter, model, optimize, and share data across systems to improve performance over time. New research is needed to explore how parallel processing and Big Data can enhance robotics.
- E. **Internet of Things:** The number of Internet-connected devices now exceeds the global human population and is predicted to increase rapidly in the next decade. Many of these are passive sensors and new research is required to develop algorithms and system designs that can address security and network reliability at scale.

4. CITRIS Sustainable Infrastructures



The energy that lights and powers our buildings, the water we drink or wash with, and the transportation systems that move us and our goods are at the heart of vital societal infrastructures. These systems affect not only our personal wellbeing and productivity but also that of our planet. CITRIS and the Banatao Institute's research in sustainable infrastructures supports the development of information technologies related to improving the efficiency of our energy, water, and transportation systems and the intersections among them. The evolution of wireless sensors and smartphones have created opportunities to understand—in real-time—the behavior of critical infrastructures and ultimately manage such infrastructures more efficiently and effectively, including actions toward mitigating greenhouse gas emissions.



<http://sustainable-infrastructures.citris-uc.org>

Proposals solicited under CITRIS Sustainable Infrastructures include (but are not limited to):

- A. **Integrated sensors** to communicate vast amounts of real-time information.
- B. **Data management** to gather, process and direct information. Proposals involving applications of BTrDB (<http://btrdb.io/>) and Giles (<http://gtfierro.github.io/giles/stack/>) are encouraged.
- C. **Advanced controls** to act on the information, thereby increasing the productivity and sustainability of energy systems.
- D. **Energy generation, storage, and distribution** to develop and prove new information technologies and systems for energy-efficient generation, storage and distribution of energy, including through advanced electrochemical and other storage systems, integration of electric vehicles as grid storage (i.e., “vehicle-grid integration”), and to improve energy end-use and distribution system efficiency.
- E. **Intelligent water infrastructures:** Proposals are encouraged that create a water monitoring system enabling any country, state, region, or city to:
 - a. Manage and operate its water system more *efficiently, sustainably, and equitably*.

- b. Better meet the challenges created by *climate change*, *population growth*, and changing *demographics*. IT tools to meet these challenges could include innovative decision models, simulation models, and use of data analysis and visualization.
- F. **Traffic management, mobility management (people and goods), and energy footprint of transportation:** Proposals involving information technology and tools with focus on increase energy efficiency for transportation are encouraged.
- G. Information Technology that supports UCOP's **carbon neutrality** goals. UC has pledged to become carbon neutral by 2025 (<http://ucop.edu/carbon-neutrality-initiative/index.html>), aiming to become the first major university to achieve this benchmark.