
Innovation lab background and goal:

The BD2K Training Coordination Center is organizing an Innovation Lab to foster new interdisciplinary collaborations among quantitative and biomedical researchers to address data science challenges arising from the use of wearable or ambient sensors. Wearable or ambient sensors, as defined here, broadly describes the necessary software and hardware that drives internet-connected devices with a health or biomedical research objective. A more-detailed description of the Lab can be found here. Some exemplar areas of quantitative interest are suggested here.

Applications are invited for the Innovation Lab on "Interdisciplinary Approaches to Biomedical Data Science Challenges from the use of Wearables and Ambient Sensors" taking place from June 15 to 19, 2016 at the UCLA Lake Arrowhead Conference Center, 850 Willow Creek Rd, Lake Arrowhead CA 92352.

The Innovations Lab process entails participation in an intensive five-day residential workshop in order to facilitate the development of new teams of early-career biomedical and quantitative investigators who generate multidisciplinary cooperative research programs through a real-time and iterative mentoring process. While prior knowledge of research at this interface is beneficial, it is more important for applicants to demonstrate their willingness to engage in collaborative multidisciplinary research. At the conclusion of the workshop, teams will be encouraged to develop proposals for submission to the funding agencies. The Innovations Lab is organized along similar lines to the NSF-organized Ideas Labs, which are modeled on the "IDEAs Factory" program developed by the Engineering and Physical Sciences Research Council (EPSRC) of the United Kingdom. The concept of the IDEAs Factory program is to organize intensive interactive multidisciplinary workshops ("Sandpits") involving around 30 participants, with the aim of developing new and bold approaches to address grand challenge questions for topics that could benefit from a fresh or divergent perspective. The participants are assisted by professional facilitators and senior scientists with relevant expertise and exposure to the topic area. The scientific experts serve as mentors and act as impartial referees during the process. Working under the guidance of the mentors, participants will form teams during the workshop to develop interdisciplinary projects to solve a data science challenge arising from a particular biomedical research question using wearables or ambient sensors.

This Innovations Lab is sponsored by the National Institutes of Health and the National Science Foundation. It will include program officers from both agencies.
Application Procedure

DEADLINE TO SUBMIT APPLICATIONS:
11:59PM, EASTERN TIME, MONDAY, April 4, 2016

Applications will be considered from researchers in quantitative disciplines (mathematics, statistics, computer science, engineering, as well as other data-intensive areas including but not limited to finance, physics, climate modeling, and astronomy) and biomedical disciplines (including but not limited to biological, environmental, and clinical domains). Researchers in the biomedical domain must demonstrate their ability to leverage wearables or ambient sensors data (e.g. data from sources including but not limited to wearable electronics, mobile devices, and environmental sensors). A committee will select approximately 30 applicants to take part in the Lab. Selected participants will have their travel and hotel expenses fully covered by BD2K TCC. Applicants must be willing to commit to stay for the entire Innovation Lab.

Selection Criteria
A selection committee has been set up, consisting of members of the Steering Committee and the Mentors Panel, chaired by the lead investigator of the BD2K TCC. Also included will be an organizational psychologist. Thirty participants will be selected from an applicant pool that is expected to top 200. The objective is to select a diverse group of participants who will be balanced across subject of expertise (mathematics, statistics, computer science, biology and medicine), geography, with attention to the inclusion of underrepresented groups. Early stage investigators (e.g. assistant to new associate professors) are highly encouraged to apply. Within the above overall criteria, applicants will be selected based on:

- Qualifications of the applicant to conduct a project in this field of research;
- Evidence of ability to work collaboratively in an interdisciplinary team;
- Evidence of ability to think flexibly and imaginatively;
- Appropriate experience and training;
- The amount and quality of the applicant’s institutional support.

Application Questions:

Please spend some time reflecting on and responding to the following questions. Your responses will help us determine your suitability for participating in the Innovation Lab.

Everyone
Given your current career trajectory and experience, would you consider your expertise to fall more into biomedical subject areas (e.g. biological, environmental, and clinical domains) or quantitative subject areas (e.g. computer science, pure mathematics, applied mathematics, statistics, modeling, engineering, or data science)?

1. Biomedical
2. Quantitative

Bio Med
1. What do you regard as some major challenges in data analytics related to wearables and ambient sensors that society is most likely to face in fifteen to twenty years from now? (50 words)
2. What areas of expertise, interests, approach or methodology do you regard as key to meeting one or more such challenge? Which of these areas of expertise do you already have and which do you need from team members?

3. Please provide two or more examples of analytical roadblocks in your research that may require the development or significant adaptation of current data science methods. (150 words)

4. Do you currently have access to a wearables or ambient sensors related data set? Please provide a brief summary of what this data consists of. (After choosing a response below, please describe in one or two sentences)

   1. I have no data.
   2. I have data, but it is not shareable right now with other lab participants.
   3. I have a sample of data that is shareable or will be shareable within a few months with other lab participants.
   4. I have a full data set that is shareable or will be shareable within a few months with other lab participants.
   5. Other: please specify

Quantitative

1. Please describe a time where you adapted or extended your expertise, methods, or approach to open up an important new research direction. (200 words)

2. Giving two or more examples of analytical methods, tools, or algorithms you have developed, what sorts of data science problems can these tools address? (150 words)

Both Groups

1. How would you respond to a colleague who has suggestions and a willingness to collaborate on translating your research area into a new opportunity that would be a novel experience for you? Any examples? (100 words)

2. The Workshop will require you to work collaboratively and intensively, generating and shaping ideas with individuals from a discipline different to your own and doing so with an open mind and a relish for problem solving. Using a comparable setting you may have experienced, how suited do you feel to participating in this Workshop? (100 words)