**2013-2014 UC Berkeley Master of Engineering**

**Capstone Project Proposal**

**Overview:**

The Capstone Project, a 5-unit Maser of Engineering course requirement, integrates core leadership coursework with a student’s engineering concentration. Capstone Project teams range from three to ﬁve students, drawn from the cross-disciplinary engineering cohort, to apply diverse knowledge and skills to actual industry problems, identiﬁed by faculty or industry partners. The Fung Institute for Engineering Leadership within the College of Engineering provides capstone cohort support and curriculum integration.

**Capstone Sponsor Information:**

Please read the following instructions and requirements before submitting your proposal. In order to be considered, this document must be completed in full. By submitting this proposal, you agree to its inclusion in the *UC Berkeley Master of Engineering Capstone Project Portfolio* for the 2013-14 Academic Year. Use of links, diagrams and images to illustrate your project is encouraged. Example projects can be found here: <http://funginstitute.berkeley.edu/programs/capstone-projects>

**Timeline for submission and important deadlines:**

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| --- | --- | --- |
| **Year** | **Dates** | **Activity** |
| **2013** | **March** | **Capstone Project Call for Proposals** |
|  | **By April 1** | Submit a one-sentence description of your project idea. |
|  | **By May 1** | **Full Project Proposals due**  Please use the proposal form supplied. |
|  | **May-July** | **Proposal Review –** screening for skill set and objective fit with incoming M.Eng. class**.** |
|  | **July-August** | **Student Project Exploration**  Industry advisors should be available for questions and interview screening of students during this time. |
|  | **August 12-31** | **Capstone Team Selection Process, Sponsor and Faculty office hours** |
|  | **September 1-12** | **Capstone Final Match:** Notification no later than Sept 12 |
|  | **Early December** | **Fall Student Poster Session** |
| **2014** | **Early May** | **Spring Student Poster Session** |
|  | **May 1-17** | **Final Student Presentations and Deliverables** to Industry & Faculty Advisors |

If selected for the 2013-2014 Capstone Project Portfolio you will be responsible for sponsoring and adhering to the terms you outline below. **As the Capstone Sponsor, please *initial* the following requirements by which you are agreeing to the following:**

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Provide a point person from your organization to advise the capstone team on a regular basis and throughout the whole duration of the project

Supply all necessary tools, software, and/or data necessary to do the project in a timely manner

Ensure the project has achievable deliverables that fit into a 9-month timeframe

Provide clear objectives for both the technical and business-related challenges of the

project

By signing below you are indicating that you completed this form to the best of your knowledge and are agreeing to all the requirements of UC Berkeley’s Capstone Project Program as listed above.

We look forward to working with you!

Name: Jiajian Chen Title:

Email: Phone:

Signature or Initials:

Date:

*Questions?* Contact Beth Hoch hoch@berkeley.edu or 510-664-4587

**Proposal Form (please complete all sections):**

|  |  |
| --- | --- |
| **Project Title** | Improve User Experiences in Indoor Navigation with Augmented Reality |
| **Industry Partner**  Company Name, Department, and Website | InNav Team, Qualcomm Research Silicon Valley |
| **Problem**  (Describe the industry problem your project addresses in 100 words or less.) | **User interface is critical for indoor navigation related applications.** |
| **Technical Challenge**  (Highlight the technical challenge of the problem in 100 words or less) | 1. Identify Point of Interest based on the context (e.g., user’s current location, search log or personal profile), given the venue map and information collected from sensors 2. Provide effective navigation or directional information in UI |
| **Objective**  (In 100 words or less, use bullet format and ensure objective is practical for a 9 month project) | **Use Augmented Reality techniques to improve user experiences in indoor navigation**   1. **Research literature in the area of computer graphics, AR/VR and HCI that are related to indoor positioning (1mo)** 2. **Develop prototype that superimposes directional information and POI information on the original 2D/3D indoor map view (5mo)** 3. **Conduct user study for the prototype (2mo)** 4. **Write a research report and/or submit a research paper to related venues (1mo)** |
| **Project Illustration (Optional)**  Include websites, videos, diagrams or images to help students understand your project | **See attached images that illustrate some possible UIs for indoor navigation** |
| **Open or Closed Model – Please check one:**  Open Model (Public collaborative and may use university lab equipment) or Closed Model (Virtual internship, private, with faculty liaison)  \* Please list the necessary equipment, software or data that is needed and will be provided to the team. | Please select one and clearly outline what, if any, resources will be provided:  **x Open Model/Public collaborative**  **Tools and Equipment that will be provided include:**  Qualcomm Android phone, public map info  Closed Model/Virtual internship  **Tools and Equipment that will be provided include:** |
| **Ideal Team Size**  (We prefer teams of 4 students, unless otherwise specified) |  |
| **Departments Accepted**  (Choose from CEE, EECS, IEOR, ME, MSE, NE. Indicate ideal team makeup and technical concentrations desired, i.e.  “1 CEE ; 1 EECS; 2 IEOR”) | *Please indicate your ideal team makeup by specifying the technical concentrations desired.*  BIOE= Bioengineering General Program  **CEE = Civil & Environmental Engineering (1)**  **EECS = Electrical Engineering & Computer Science (3 or 4)**  IEOR = Industrial Engineering & Operations Research  MSE = Materials Science & Engineering  ME = Mechanical Engineering  NE = Nuclear Engineering  **The team: 4 EECS, or (3 EECS + 1 CEE, in which CEE student should have experiences in indoor navigation related area)** |
| **Specific Skills Required**  (i.e. *C/C++/C#, Python ,CAD, Robot Kinematics, MATLAB, Excel Financial Modeling, etc.*)  The more detail provided here the better team match you will receive. | Required: C/C++, OpenGL or equivalent graphics library  Recommended: AR/VR tracking package (e.g., AR toolkit, Vuforia), development experiences in mobile platform |
| **Coursework**  (Indicate any recommended/required prerequisite/co-requisite classes) | Required: Computer graphics,  Recommended: HCI (i.e., user study and design of UI), AR/VR |
| **Industry Advisor(s)**  **Name, Email, Phone Number**  \*If this is a closed model an Industry Point Person from your organization is required for the duration of the project and must be available to advise the team on a regular basis and provide all necessary resources | Jiajian Chen  jiajianc@qti.qualcomm.com  408-533-9410 |
| **Faculty Advisor(s) or Academic Liaison**  **Name, Department, and Email**  \*If this is an open model the Faculty Advisor or Academic Liaison is the primary party responsible for the advising and guidance of the capstone team, including providing all the necessary resources |  |

