Faculty Name Behrouz Shafei

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Brief description of Summer Research Project (please explain the interdisciplinary nature of this project).

Civil infrastructure systems are tied up, directly or indirectly, with every country’s economy in a major way. The state of nation’s civil infrastructure has also significant impacts on the safety and quality of living. Among various infrastructure components, the highway bridges play a key role in a transportation network and huge money is spent every year to ensure their functionality. Over the time, highway bridges are aging, rapidly deteriorating, and becoming increasingly vulnerable to catastrophic failure during natural or man-made hazards. In the proposed research, an undergraduate student will be working on the vulnerability assessment of concrete materials subjected to corrosive agents. The intrusion of aggressive agents into the concrete porous media will be evaluated and sustainable techniques for the improvement of the life time performance of concrete structures will be investigated. A significant involvement in the topics related to the chemical engineering and materials science is expected.

Brief description of what the student will be doing:

The student is expected to complete the following tasks:
   1. Comprehensive literature review on diffusion of deteriorating agents into concrete
   2. Collect actual cases of deteriorated structural components through field trips
   3. Develop computer models to simulate the process
   4. Evaluate the life-time performance of bridges
   5. Write a final report, prepare a poster, and present the outcome in a seminar

Is this a CASA-related project?  Yes ___ No x

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):

Student must be in junior or senior year with a major in Civil Engineering or Chemical Engineering
Must have a GPA of 3.5 or higher

Did you mentor a student last summer in the College REU Program?  
Yes____   No x

If yes, please describe the outcomes for that student (i.e. Honor's thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued):

N/A

Please return this form to: lrobidou@ecs.umass.edu by February 3, 2012