IEH Undergraduate Intern Mentoring Opportunity

Deadline: **February 22, 2013**

Selections Announced: **mid-March, 2013**

Name/Title/Institution(s) of senior mentor(s): Antonio Baptista

Name/Title/Institution(s) of frontline mentor(s): Charles Seaton

Project Title: Symbolic regression analysis of ecologically significant model parameters in support of the Columbia River Treaty review process.

Context for Project: For the correlation analysis for the CR Treaty review process, we have limited ourselves to linear and pseudo-linear regression methods. It is clear from visual inspection of data that the relationships between the forcing and Salmon Habitat Opportunity (SHO), Salinity Intrusion Length (SIL) and Plume Volume (PVO) are complicated, involving steps and reversals. We have made an initial attempt at using symbolic regression techniques for the correlation analysis, but the subject is large enough and complex enough that it was not worth pursuing in the time available.

The proposed summer REU would use symbolic regression tools (possibly the GTIPS matlab toolbox or the Eureqa API) to develop a substantially improved SIL correlation and to develop a usable SHO correlation for each reach and SHO type. This would directly improve our ability to answer CR treaty relevant questions. The timing of a summer REU is reasonably well aligned with the CR treaty deadlines. As a long term side-effect, the REU would develop transferable methods for doing symbolic regression on CMOP models and data. These methods could then be applied to ETM prediction (for example), providing an indirect benefit to Initiative IV.