2009/2010 Summer Session Research Scholarship Project

Supervisor: Professor Aditya Ghose

Title: A Green Software Engineering Tool/Framework

Project Description:
The need for climate change mitigation has led to a growing realization that climate impact (both of the computational machinery as well as of other systems/infrastructure controlled by computational machinery) must inform the software engineering process. Green software engineering is in its infancy, but holds out great promise. A key component of green software engineering is incorporating carbon-centric principles in the software requirements engineering and design phases. This includes the ability to assess the carbon impact of the target system at the level of requirements and design models, and the ability to offer decision support functionality to guide analysts in re-designing models whose carbon impact is deemed to be unacceptably high. This project will aim to make both theoretical and practical advances towards these goals.

Expected outcomes:
1. A (possibly preliminary) conceptual framework, and associated methodology for carbon-centric software requirements analysis and design.
2. Some validation of the framework/methodology in the context of a carbon-aware computer-aided software engineering (CASE) tool. Tool development (if any) will be within the Eclipse framework (and may require some modicum of Java coding).

The relative mix of items (1) and (2) in the project can be tuned to suit the candidates preference/abilities.