Project title: Challenges and opportunities of Serverless Compute

Brief Description of Design Project Goals:

Overview: In a conventional cloud computing environment, users deploy applications on the number and type of servers they deem necessary. A new programming model has recently gained traction, called serverless compute, where users only need to worry about writing application code while cloud providers manage deployment across servers and charge users only for the compute power they use [1]. Instead of thinking about applications as collections of servers, developers define applications as a set of handler functions which can be triggered by various events and have access to a common datastore. Examples of this new model include Amazon Lambda and Google Cloud Functions. Serverless benefits a wide range of emerging applications, including microservices, and IoT workloads. This project examined the challenges and opportunities of serverless computing for cloud and IoT services. Students will use an open-source serverless platform, Fission, and a few representative applications and compare performance, scalability, and cost versus conventional cloud systems.

[1] Serverless Computation with OpenLambda

Specific MEng Contribution:
- Characterize the behavior of cloud and IoT applications on a serverless programming model
- Design a quality-of-service aware scheduler that determines how tasks should be mapped to cloud resources over a serverless framework.

ECE Field Advisor Name: Christina Delimitrou
- Email – cd434@cornell.edu
- Phone – 255-9316
- Office – 332 Rhodes

Project Web Site: Contact Christina for more details.

Number of MEng Students Needed: 2 - 3

Required Skills: Experience in C++/Python, Linux, networking, basic distributed systems principles.

Estimated Project Time Frame:
2017-18 Academic Year, Two (2) Semesters