MEng Design Project Announcement – 2018-19 AY

**Project title:** Stochastic circuits

**Brief Description of Design Project Goals:**

**Overview:** Superparamagnetic junctions are an efficient source of programmable random generation. Stochastic circuits exploiting randomness are an approach to energy-efficient computation, cryptography, and fast inexact non-Turing pattern extraction. This task will employ Verilog based model of random telegraph behavior of superparamagnetic junctions, together with digital and analog circuits for independent random replication and transformations to evaluate and show efficient circuits in encoding, in secure communications, and in pattern matching.

**Specific MEng Contribution:**
(a) use Verilog codes, Python and circuit tools, (b) perform simulations, (c) design circuits, (d) evaluate and quantify energy efficiencies and e) develop an example application in stochastic computation.

The student is expected to have a background knowledge in circuit design, principles of solid state, and computation. And know Verilog and Python.

**ECE Field Advisor Name:** Sandip Tiwari
- Email – st222@cornell.edu
- Phone – 255-4021
- Office – Phillips 410

**Number of MEng Students Needed:** 1

**Required Skills:** Python, probability and statistics, neural networks, introductory magnetism and solid-state, information mechanics.

**Estimated Project Time Frame:**

The advisor will meet the student at least once a week individually. Weekly effort and discussions are expected with a strong collaboration that develops in-depth understanding.

2018-19 Academic Year, Two (2) Semesters