

## PhD, MSc and Post-doctoral Positions

PhD, MSc, and post-doctoral positions are available in the area of optimization and directed learning algorithms for controlling the simulation of variation-aware circuit designs.

With the continuous scaling of integrated circuit (IC) technology, it is increasingly challenging to ensure that nanometer-scale circuit designs will work in all defect-free fabricated chips despite unavoidable PVT variations, i.e., variations in the process parameters, voltage conditions and operating temperature. IC designs must be verified to operate correctly, in long simulations, for a large number of PVT scenarios. Directed learning algorithms that use Gaussian Process Models to approximate circuit behaviour have already been developed to guide the search for the worst-case PVT corners. While the Gaussian Process Model has proven to be effective at learning and representing circuit behaviour, it is important to fully investigate the many alternative Computational Intelligence (CI) approaches that might offer advantages for some classes of circuits. Especially, the most variation-sensitive classes of circuits need to be better characterized so that improved verification by intelligently directed simulation can be developed that better exploits knowledge of circuit structure.

The post-doctoral fellow is expected to have a solid background in at least one of the following areas: optimization and function approximation algorithms, Gaussian process and other related models, Machine Learning and Computation Intelligence methodologies, variation-aware circuit design and circuit simulation. Strong programming skills, ideally with experience in Python, Matlab and/or Cadence, are preferred. The duties of the post-doctoral fellow include developing new and improved simulation control algorithms, helping to supervise graduate and/or co-op students, and preparing manuscripts for publication in referred journals and/or conferences. The position is initially for one year and could be extended, depending on performance and funding availability.

PhD and MSc applicants are expected, but not required, to have a similar background in the aforementioned areas.

Applications should be sent to Drs. Jie Han, Bruce Cockburn and Witold Pedrycz (emails: [jhan8@ualberta.ca](mailto:jhan8@ualberta.ca), [Cockburn@ualberta.ca](mailto:Cockburn@ualberta.ca), [wpedrycz@ualberta.ca](mailto:wpedrycz@ualberta.ca) ). Applications will be reviewed immediately, but the positions will remain open until filled.