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Dear Selection Committee,

I'm writing this letter to enthusiastically support my Ph. D. student Hanbin Hu's application to the A. Richard Newton Young Student Fellow Program. Hanbin has worked on analog/mixed-signal (AMS) circuit design verification and application of machine learning to EDA in my group since fall 2016.

Prior to his joining of my group, he did outstanding work at Shanghai Jiao Tong University, from which he obtained his B.S. and M.S. degrees. His M.S. research on analog CAD led to one TODAS, one ISCAS, and one ASICON paper. Such research productivity is rare even among the very top M.S. students.

Hanbin is a 4.0 GPA student at Texas A&M University. On the research side, Hanbin's work has centered on addressing the challenging and yet important problem of verifying mission-critical analog/mixed-signal (AMS) circuits with extremely high reliability requirements by using a combination of formal and machine learning (ML) techniques. Innovations towards this end will enable the development of electronics deployable in safety-critical systems such as autonomous vehicles.

Hanbin's research contributions in the above domain are outstanding. He has published a sequence of three papers at DAC and ICCAD, proposing much needed technologies for enabling AMS verification while dramatically reducing expensive simulation/measurement data acquisition. Among these, his DAC'18 paper presents the *first approach* integrating machine learning with formal techniques for AMS verification. His ICCAD'18 paper is the *first work* demonstrating the use of Bayesian optimization, a statistical learning/optimization framework, for AMS verification, supported with custom-designed acquisition functions. This paper was among the six submissions nominated for the William J. McCalla best paper award at ICCAD'18.

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Hanbin is expending his research to develop robust statistical and deep learning techniques. His ongoing work aims at facilitating methodologies for assessing robustness of ML models and enabling trustworthy ML-driven EDA. His work has attracted interest and engagement from Texas Instruments, Intel, and IBM.

Apart from doing his own research, Hanbin is passionate about helping others. He has unselfishly mentored five junior graduate students to get started on research.

The A. Richard Newton Young Student Fellow Program would offer Hanbin a wonderful opportunity in exploring the latest developments in EDA and VLSI design. If he is selected for the Program, I will support him with necessary matching funds.

I believe Hanbin is a very deserving candidate for the Fellow Program. I support his selection wholeheartedly.

Sincerely,

Peng Li
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