No. 3663 Zhongshan Road(North)
Shanghai, China, 200062
Tel: +86-15921769918
Email: fsong@sei.ecnu.edu.cn

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To Whom It May Concern:

I am writing to apply for the tenure-track faculty position in School of Information Science and Technology (SIST) at ShanghaiTech University as advertised on your university website. I am currently a lecturer at East China Normal University (my contract will be expired at the end of July, 2016). I am extremely interested in obtaining this faculty position with your university, which is an ideal university to continue doing my research on software verification and its application to system safety and security. I believe my prior research experiences and commitment to teaching make me well qualified to meet the needs of the position.

Fully funded by French National Center for Scientific Research (CNRS), I conducted Ph.D. research in the Laboratoire d'Informatique Algorithmique: Fondements et Applications (LIAFA) at CNRS & University Paris-Diderot (Paris 7), under the supervision of Dr. Tayssir Touili. We proposed an optimal algorithm for model-checking Pushdown Systems (PDSs) against computational temporal logic, based on which we developed a sequential C/C++, Java program model-checker, PuMoC. PuMoC found several bugs in Linux derive source codes in our experiments. We also proposed a new model-checking approach for malware detection that takes into account the behaviour of the stack which is more precise than existing approaches. Based on this approach, I developed a malware detector for Android and Windows OSs and experimental results demonstrate the benefits of our approach. Our research on this field has been recognized by the verification community. For instance, one paper on this methodology got EASST best paper award at ETAPS/TACAS12 conference. Prof. Flanagan from University of California and Prof. König from University of Duisburg-Essen commented that " It makes an original contribution by modelling programs including the stack by pushdown systems and using a model-checking procedure for temporal logics to detect malware."

In 2013, I joined East China Normal University (ECNU) where I carried

out research individually and also established long-term collaborative relationships with several young excellent researchers. I individually studied the model-checking problem of pushdown systems with transductions and applied this to software verification. This technique is applied to verify sequential programs with call-by-reference parameter passing, while existing works only considered the model-checking problem of programs with call-by-value parameter passing. With Dr. Tayssir Touili, I studied the model-checking problem for dynamic pushdown networks which are a natural model of multi-threaded programs with dynamic thread creation and recursive procedure calls. We proposed model-checking algorithms for dynamic pushdown networks against single-indexed LTL and CTL which allow to automatic verification of liveness properties. While, existing techniques only can verify safety properties for this kind of programs. I comprehensively investigated the satisfiability problem of variants temporal logics together with Dr. Zhilin Wu from the Institute of Software, Chinese Academy of Sciences and Dr. Taolue Chen from the Middlesex University, and investigated software vulnerability detection approach with Dr. Yang Liu from Nanyang Technological University when I was an invited researcher there.

Besides, I applied for research grants, taught undergraduate/graduate courses, and co-supervised several undergraduate/graduate students. In particular, I got three grants respectively from NSFC, Shanghai Pujiang Program and Shanghai Chenguang Program and one of my co-supervised Ph.D. students got a fund for Sino-French joint Ph.D. program.

At last but not least, my research background meets some research fields of SIST, namely model-checking and system security. This will strengthen existing research team at SIST. My other research areas such as temporal logics and automata theory could complement the research fields of your school. I am very excited about the opportunity of joining SIST at ShanghaiTech University, and I am enclosing my curriculum vitae, research plan and teaching statement. I will gladly provide any other supporting materials upon request. I will be in Shanghai in the next few months, and would be glad to meet you. Thank you for your consideration, and I am looking forward to hearing from you soon.

<div align="center">Yours Faithfully</div>

<div align="center">Fu Song</div>