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Re: Mr. Yanxin Lu

To Whom It May Concern:

My name is Swarat Chaudhuri. I hold the position of Associate Professor at Rice University, in Houston, TX, USA.

This letter serves to confirm that Mr. Yanxin Lu was a student of Rice University from 08/20/2012, through 05/11/2019. Mr. Lu was awarded a Master's degree in Computer Science on 12/30/2015, and a Ph.D. in Computer Science on 05/11/2019. I was Mr. Lu's Academic Advisor and have personal knowledge and/or possess records under my control to reflect the education history of Mr. Lu.

I have reviewed the transcripts of Mr. Lu and am able to verify that during his graduate degree studies, Mr. Lu completed coursework involving each of the following:

- Algorithms, data structures, or systems software;
- Solving analytical problems using quantitative approaches;
- Gathering, manipulating, or analyzing complex, high-volume, high-dimensionality data from varying sources;
- Communicating complex research in a clear, precise, and actionable manner;
- Research in topics closely related to machine learning, NLP, recommendation systems, pattern recognition, signal processing, data mining, artificial intelligence, information retrieval, or computer vision;
- Performing research that enables learning the semantics of data (images, video, text, audio, or other modalities) and advances the technology of intelligent machines;
- Devising better data-driven models of human behavior;
- Adapting standard machine learning methods to best enterprise modern parallel environments: distributed clusters, multicore SMP, or GPU;
- Developing highly scalable classifiers and tools leveraging machine learning, statistics, regression, rules-based models, or mathematical models; and
- Java, C++, Perl, PHP, or Python.

These subject matters were satisfied by the following courses listed on Mr. Lu's transcripts:

- COMP421: Operating System/Concurrent Programming;
- COMP527: Computer Systems Security;
- COMP411: Principles of Programming Language;
- STAT 640: Data Mining & Stat Learning;
- ELEC 677: Introduction to Deep Learning;
- COMP600: Graduate Seminar;
- ENGI 600: Graduate Communications Seminar;
- ENGI 601: Engineering Comm Workshop;

During his graduate degree studies, Mr. Lu also completed a Ph.D. thesis involving each of the following:

- Algorithms, data structures, or systems software;
- Solving analytical problems using quantitative approaches;
- Gathering, manipulating, or analyzing complex, high-volume, high-dimensionality data from varying sources;
- Communicating complex research in a clear, precise, and actionable manner;
- Research in topics closely related to machine learning, NLP, recommendation systems, pattern recognition, signal processing, data mining, artificial intelligence, information retrieval, or computer vision;
- Performing research that enables learning the semantics of data (images, video, text, audio, or other modalities) and advances the technology of intelligent machines;
- Devising better data-driven models of human behavior;
- Adapting standard machine learning methods to best enterprise modern parallel environments: distributed clusters, multicore SMP, or GPU;
- Developing highly scalable classifiers and tools leveraging machine learning, statistics, regression, rules-based models, or mathematical models; and
- Java, C++, Perl, PHP, or Python.

His research projects included:

- *Learning to Grade Student Programs in Massive Open Online Course*: Developed a machine learning algorithm which automatically grades graphical programs submitted by students in Massive Open Online Course. In this project, Mr. Lu gathered and analyzed a large amount of program data. He also extracted useful NLP features and patterns from those data and helped devise a machine learning model for grading graphical programs.
- *Improving Peer Evaluation Quality in Massive Open Online Courses*: Implemented a web application for peer evaluations and showed that this providing feedback can improve peer evaluation quality in Massive Open Online Course. Mr. Lu conducted a user study where he deployed a highly scalable web application used to gather feedback for peer evaluations from thousands of students online, analyzed the quantitative data and

showed that providing feedback can improve the quality of peer evaluations. He presented this work in WWW 2015, the top academic conference focused on the worldwide web.

- *Program Splicing*: Mr. Lu developed a method for automatically generating the source code of programs using an existing code corpus. As part of this project, he gathered a large number of programs from online repositories, extracted data for learning the semantics of the data and implemented a data-driven algorithm which generates programs automatically. He also implemented a scalable web application which demonstrated this algorithm and presented the work in ICSE 2019, the foremost academic conference in the area of Software Engineering.

If you should have any questions regarding Mr. Lu's studies at Rice University, please contact me.

Sincerely,



Swarat Chaudhuri

Associate Professor
Department of Computer Science, Rice University