



Universidade Federal de Minas Gerais
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Department of Computer Science & Engineering (CSE)
Graduate Admissions Office
University of Washington

Dear Colleague:

I am very pleased to write this letter on behalf of my student [REDACTED], whom I understand has applied to the University of Washington for entrance in the Computer Science graduate program. I met [REDACTED] one year ago, when I transferred from the Statistics Department to the Computer Science Department at my home university, motivated by my interest in machine learning and the convergence between computer science and statistics. [REDACTED] is an exceptional student and I believe he has a great potential as a researcher if he works in a stimulating environment.

My comparison group includes my colleagues from the Statistics Department at the University of Washington, where I completed my PhD between 1990 to 1994. I also consider [REDACTED] in comparison to my former statistics students who have entered graduate programs in US over the last 4 years, and who finished under the guidance of Peter Diggie (John Hopkins), Jim Berger (Duke), Sudipto Banerjee (University Minnesota), and Jun Yan and Dipak Dey (University Connecticut). All these advisors seem to be happy with the students' abilities and the education we have been providing here at UFMG. I think [REDACTED] is on the same league of these other students.

[REDACTED] has taken two courses with me over the past 12 months: Probability and Inference for Computer Science (which will conclude in three weeks) and Probabilistic Graphical Models (PGM), which was ultimately titled Structured Prediction through Conditional Random Fields (translated from Portuguese). [REDACTED] excelled in both courses, demonstrating remarkable interest, ability, and creativity. He achieved perfect scores in the PGM course and is on track to do the same in the Probability and Inference course. His overall performance in his Master of Science coursework, as reflected in his transcripts, is outstanding. Although [REDACTED] experienced a period of depression during his first undergraduate year due to a family loss, resulting in lower scores, he has since compensated with exceptional performance.

In Brazil, we do not use the curve grading system adopted in the US, and therefore even excellent students do not always have straight A's on their transcripts. Given that our courses use rigorous



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textbooks and challenging tests, [REDACTED]'s performance is particularly impressive, placing him among the top 2% of students at our university. The UFMG Computer Science Graduate Program is one of the top three programs in Brazil, according to our National CAPES Evaluation. Therefore, you can deduce that [REDACTED] is one of the best computer science students Brazil has to offer.

In 2012, during my PGM course, [REDACTED] developed a recommendation system based on Latent Dirichlet Allocation (LDA). He allowed for customer-specific and item-specific random effects and used LDA to cluster items and customers. We plan to expand this by adopting a Dirichlet process, which will constrain clusters to be the same in the two dimensions, customers and items. This is still under test, but it is a promising new technique that is outperforming other competitors in our small set of simulations undertaken so far. In the Probability and Inference course, still underway, he is studying the statistical design of experiments theory to apply to A/B tests in recommendation systems.

These projects require a great deal of programming, and [REDACTED] has learned a substantial amount of probability and statistical theory, such as likelihood theory (sufficient statistics, exponential family, etc.), the EM algorithm, Markov chain Monte Carlo methods to sample posterior distributions, and conditional random fields. He has much more knowledge of, and enthusiasm for, statistics than the typical computer science student. [REDACTED] is a very keen student and is well-versed in most of the recent relevant papers in machine learning and statistics connected with recommendation systems and A/B tests. He is very independent and has the ability to solve statistical and computational problems, qualities required to be a successful researcher.

I am sure his Master of Science advisor will be able to provide more details about his work. I also know that he works in a start-up company which develops and implements recommendation systems for commercial companies in Brazil. While he values this experience, he is currently interested in pursuing a more academic route.

The weakest aspect of [REDACTED]'s education is his mathematical knowledge, which is not as strong as might be ideal for someone interested in machine learning topics. Under my influence, he has built a very strong background in statistics, much stronger than most computer science students. Although he is doing great in the math courses he has taken so far, he has not taken enough mathematics courses, such as Real Analysis and Functional Analysis.



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In addition to his professional qualities, his proficiency in English is excellent, and he can easily work as a TA. He is also a very nice person and gets along well with everyone. My previous experience has been largely in advising statistics students and mentoring the best ones to enter strong US graduate programs. [REDACTED] is one of the best students my university has prepared in recent years, and I am confident that he has what it takes to succeed in excellent US programs, such as the UW Statistics Department. I also predict [REDACTED]'s success in the Computer Science program at UW. I highly recommend him with enthusiasm.

Sincerely,

Renato M. Assunção