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INSERT DATE

Department of Homeland Security

United States Citizenship and Immigration Services

**Re: Dr. Ying Li, Outstanding Researcher in the Field of Mathematics and Artificial Intelligence**

Dear USCIS Officer,

Please accept this letter on behalf of Dr. Ying Li. It is my understanding that Dr. Li is filing an I-140 Immigrant Petition for Classification as an Outstanding Researcher so that she may continue her important endeavors at Wells Fargo Bank. I am writing, therefore, in order to attest to the original contributions of major significance that Dr. Li has provided to the field of mathematics and artificial intelligence especially their applications to financial services.

I am the executive vice president and head of Model Risk for Wells Fargo Bank N.A. I received my Ph.D. in engineering from Wayne State University in 1995 and, subsequently, held master’s degree in engineering and management from Massachusetts Institute of Technology. For the last eleven years, I have been responsible for enterprise model risk management and serving as Chair of Model Risk Committee at Wells Fargo. My current job focusses model validation management and research in banking. Prior to my current position, I was the modeling and analytics director and chief model risk officer at Lloyds Banking Group in the United Kingdom. Before joining Lloyds, I was a senior credit risk executive and head of Quantitative Risk at Bank of America. Prior to my career in banking, I was a product design manager in the Powertrain Division of Ford Motor Company. I hold several U.S. patents in both finance and engineering. I have published numerous technical papers and am a co-author of the book Design and Modeling for Computer Experiments. I have published numerous peer-reviewed articles in leading scientific journals and have given hundreds of presentations at international and national conferences. My work has been cited by other top scientists. My technical expertise and interests include quantitative risk, particularly credit risk modeling, machine learning and computational statistics. Given my extensive experience, I believe that I am qualified to judge the professional credentials of Dr. Li in relation to others in the field and to assess Dr. Li’s international recognition and scientific contributions to our field.

I am familiar with Dr. Li’s outstanding research at Wells Fargo. After completing her Ph.D. at the University of Wisconsin-Madison, Dr. Li joined Wells Fargo as a researcher in the Advanced Technologies for Modeling (ATOM) team at Cooperate Model Risk department, which I lead as the head. On my team, Dr. Li has conducted three, very valuable, research projects that relate to handling difficulties in model real implementations and controlling model risks. The three projects focus on model compression for reducing the model size, generating meaningful unit test cases with large language models for challenging the model to detect model weakness, and ML/AI/large language models explainability. These projects are important for us to understand how the model performs and how they make their decisions when they see the data instead of working as a blackbox. Understanding and explaining these models help us to improve model risk control to prevent them from malfunctioning and also to identify where the model’s weakness are. Model compression helps us optimize the model implementation process for real-life scenarios to have a lighter and better model. As the ML/AI models are becoming increasingly complex and larger and also much more widely used, it’s a hard question to interpret them and there are big concerns about the transparency and reasonability of their logic in making a decision/prediction. Dr. Li’s work is extremely important for the AI field considering all these concerns and their necessity. At the same time, such ML/AI models are not only used and impacting the financial services field, the same models are used in all industries including but not limited IT, medical etc. Dr. Li’s work is implemented on both Wells Fargo internal data and external public data from different fields. Her research work is going to change and improve not only AI practice in finance but also all other related industries.

First, Dr. Li investigated the theory and practical experiments for model compression technique for large models. More specifically, Dr. Li designed experiments to fully understand how knowledge distillation, a widely used model compression methodology in multiple applications fields involving large Machine Learning (ML) and Artificial Intelligence(AI) models, works. Dr Li shows the theory foundation of knowledge distillation mechanism and the different sources of performance gains for a small model to learn from a large model for practical guidelines in industry implications, such as how to make a small enough model that can be downloaded on a small laptop or even a mobile phone with limited memory and storage space to make good and accurate prediction after learning from a large model. Dr. Li’s results were presented in internal company-wide ML & AI conference *AI wise.* Her work has since helped to provide unique and ground breaking explanation to the model compression method clearly which is widely adopted in not only banking but also many other areas such as IT, medical services where big data and large models play an important role and small models are needed for faster and lighter real use cases in practice and is therefore unquestionably an original contribution to the field.

Second, Dr. Li created a pipeline to leverage the power of large language models to generating diverse and meaningful unit tests for validating the models in production. Her research, specifically, dealt with the large language models’ linguistic ability to detect potential weakness and provide more interpretation of financial models. Unit testing is the process where we test the smallest functional unit of code in computer science world, which is innovatively transformed here to challenge the large-scale ML&AI models for whether they understand the simple test cases in different topics or not. Dr. Li’s pioneering research successfully created a novel computational technique capable of the automation of generating good and simple test cases from LLM not only with high quality and linguistic diversity but also consistence with the original data distribution. Her computational algorithm will allow AI researchers and practitioners to generate most effective unit test cases in multiple topics that are from the real data, a major advancement that has the potential to drastically improve model weakness detection options for all language models used everywhere. Model risks regarding bias, discriminations etc. potentially exist and are hidden throughout the current data in large language models in financial sector like chatbot, complaint classification, customer and agent phone calls, and email communications. All these model risks are serious concerns that we must control and eliminate for meeting requirements of financial regulatory and by providing better services we can avoid any serious consequences By generating diverse test cases with similar topics but the model never saw before, we can challenge the models and detect potential model weakness to healthily and efficiently control these risks. Thus, Dr. Li’s original research contributions to the field of large language models generation techniques will not only advance her field and the banking industry, but improve the quality of models and automation in all industries.

Finally, Dr. Li developed systematic strategies to explain different language models with applications in financial services. Her findings advanced the guidelines for validating and reduce the model risk of financial service language models such as chatbot, complaint processing etc. by explaining how the models are thinking and making their decisions for every specific input.

Dr. Li’s work will help model validators and auditors determine whether the model is making its decision based on mathematics-based logic. Previous trains of thought can only explain per-instance local explainability – e.g. we can only take look at one text at a time to understand how the model is thinking in the current text. But we can’t go through all texts manually in this big data world when there are instances where we have 1 million (or more) data points. Dr. Li’s work made a breakthrough by providing high level explainability to the model globally. Her work is based on all the data and it makes decisions based on the model’s topics – from fraud to a regular email request. This certainly corroborates the significant impact of her work, evidencing both her influence on her peers in field as well as influence on the daily operations of the banking industry.

Since entering the financial sector, Dr. Li has far surpassed expectations for her valuable work, which is difficult to accomplish. She has also continued to make important contributions to mathematics and artificial intelligence for financial applications which can benefit the field at large. Her work is impactful to Wells Fargo and the applications of it is useful and influential to other financial institutions worldwide. While at University of Wisconsin-Madison, Dr. Li has, among other things, also created mathematical models and developed and validated analytical methods to characterize the meteorological conditions that would benefit more accurate weather forecast. She built and analyzed big data biostatistical models in genomics for medical treatments by leveraging her math and AI knowledge. It is for this reason and many more that I do not hesitate to confirm that Dr. Li is a researcher of the highest caliber whose reputation and contributions to the field of mathematics and artificial intelligence confirm her qualifications as an Outstanding Researcher.

In sum, I believe that Dr. Li has precisely the qualities that describe a person with outstanding research ability, and, as such, she will continue to make major research contributions in the field of mathematics and artificial intelligence. Dr. Li has already made several original contributions to the field of mathematics and artificial intelligence, and I believe that, if given the opportunity to continue her research at a world-class financial institution such as Wells Fargo, Dr. Li will continue to make significant scientific advancements that will improve the live quality with AI technology around the world. I, therefore, support Dr. Li’s application for First Preference Employment-Based Classification as an Outstanding Researcher.

Sincerely,

NAME

TITLE

CONTACT INFO