

LETTER OF RECOMMENDATION

I, Prof. Axel-Cyrille Ngonga Ngomo, professor of Computer Science at the University of Paderborn, Germany, take this opportunity to give my strongest endorsement for Mr. Dwaraknath Gnaneshwar. I guided him in a research project on Multilingual Neural RDF verbalization using Graph Attention Networks at the Google Summer of Code for DBpedia. Mr. Gnaneshwar showed exceptional technical and scientific methodology skills. The project aimed to create an end-to-end deep learning model to verbalize Resource Description Framework (RDF) knowledge graphs in multiple languages.

Mr. Gnaneshwar began by doing a thorough literature survey, identified gaps in existing approaches, and studied various state-of-the-art methodologies. He summarised his findings in a detailed document discussing the pros and cons of each approach and selected the suitable model. Early on, Mr. Gnaneshwar identified ways in which he can improve the work done to represent RDF triple sets as graphs. He leveraged the inherent structural information by implementing graph neural networks using attention-based models, like Transformers. Once we identified the limitations of using existing approaches for our work, Mr. Gnaneshwar did not hesitate to design his implementation from scratch. He showed impressive programming abilities by writing efficient code to utilize GPU accelerators. He designed the code-base to entirely operate in the cloud and browser to leverage the free GPUs provided by Google Colab. Lack of resources never bogged him down. They only motivated him to come up with clever hacks.

Mr. Gnaneshwar never hesitated to ask questions. He is a sharp listener and actively takes the initiative to solve a problem before seeking guidance. Nearly three months into the project, the project had slowed down due to an unexpected technical bug. Within a week, Mr. Gnaneshwar dissected Transformer architecture and isolated the problem, with a calm head all the while. His comfort with tools and his knack of identifying subtle bugs broke the wall for us. Mr. Gnaneshwar also showed a deep understanding of the underlying mathematics of Machine Learning. His comfort with theory as well as engineering large scale systems helps him approach problems with a structured thought process. This meticulousness sets him apart from other undergraduate students.

His research resulted in a full paper into the International Semantic Web Conference 2020, a flagship conference for semantic web technologies. Our results outperformed existing baselines by a large margin. Furthermore, our work was the first to establish baselines in bilingual and multilingual text generation. His systematic and methodical way of defining and solving problems, along with his clear and calm nature, helps him set higher standards and face stronger competition internationally. Mr. Gnaneshwar has my strongest recommendation for your program. I would be happy to provide any further details, should you require any further clarification.

Yours sincerely,

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