UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

FAKULTÄT FÜR ELEKTROTECHNIK, INFORMATIK UND MATHEMATIK

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To whom it may concern

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Letter of Recommendation

I herewith wholeheartedly recommend Mr. Dwaraknath Gnaneshwar for a fellowship at CERN. He was guided at my research group in a research project on Multilingual Neural RDF verbalization using Graph Attention Networks at the Google Summer of Code for DBpedia. 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 showed exceptional technical and scientific methodology skills. He began by carrying out a thorough literature survey, identified gaps in existing approaches, and studied various state-of-the-art methods. 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 to improve the work done to represent RDF triple sets as graphs. In particular, he was able to leverage the inherent structural information of knowledge graphs by combining graph neural networks with attention-based models.

Mr. Gnaneshwar went on to design and implement a very effective solution. 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 and was able to adapt an implementation of transformers for these purposes without external support. Mr. Gnaneshwar also showed a very good grasp of the mathematics of machine learning. His understanding of the theory as well as his ability to engineer optimal implementations of his ideas, helps him address problems in a holistic manner. This plurality sets him apart from other undergraduate students.

His research resulted in a full paper at the International Semantic Web Conference 2020, a top-tier conference for semantic web technologies. The results we achieved outperformed existing baselines by a significant margin. Furthermore, our work was the first to establish baselines in bilingual and multilingual text generation. Mr. Gnaneshwar never hesitated to ask questions. He is a very attentive listener and actively takes the initiative to solve problems before seeking guidance. His systematic and methodical way of defining and solving problems, along with his meticulous approach to problem solving help him solve complex problems efficiently and innovatively. I wholeheartedly recommend Mr Gnaneshwar for your program. Do not hesitate to contact me if you require any further clarification.

Sincerely,

Prof. Axel-Cyrille Ngonga Ngomo