To whom it may concern

Narges Ghotbizadehvahdani, born January 17, 1983, was employed at IBM Research – Zurich as Student for her Master thesis from September 1st, 2024 until February 28, 2025 in the team of AI for Climate Impact led by Dr. Thomas Brunschwiler and under the supervision of Romeo Kienzler.

The IBM Research – Zurich Laboratory is the European branch of IBM's research division, which employs some 3000 individuals at twelve research laboratories worldwide. It is the largest industrial IT research organization in the world. Cutting-edge research and outstanding scientific achievements — most notably two Nobel Prizes — are associated with the Zurich Lab.

During her time at IBM Research, she worked on the following tasks:

- Designed and implemented an instruction-following pipeline for text-to-geospatial SQL dataset generation, integrating database metadata and chain-of-thought reasoning.
- Fine-tuned Meta_LLaMA3.1 using QLoRA, applied low-rank adaptation techniques, and optimized deployment by converting the model to GGUF format and Ollama.
- Evaluated model performance using OpenAPI and LangChain, ensuring robustness and real-world applicability.
- Enhanced text-to-SQL accuracy through advanced prompt engineering, utilizing Meta Prompts and query optimization techniques for improved GeoSpatialSQL generation.

She demonstrated her ability to both work independently and as well as with the team. She is a motivated, independent student that quickly gained a good understanding of the tasks and proposed and implemented feasible solutions. She worked in a productive manner and managed her time and work efficiently. During the project, she was also able to improve her communication and presentation skills.

We would like to thank her for her contribution and wish her all the best for the future.

IBM Research GmbH   **IBM Research GmbH**

Dr. Thomas Brunschwiler   Claudia Longchamp

Manager AI for Climate Impact   Human Resources

Rüschlikon, 28. February 2025