Dear Satoshi Takabe-sensei,

I hope this message finds you well. My name is Krish Bakshi, and I am writing to express my interest in contributing to the groundbreaking research conducted at Takabe Laboratory and applying for your master’s program at Tokyo Institute of Technology Fall/ September 2025 intake. Your innovative work in statistical physics, signal processing, machine learning, and optimization, particularly your publications such as *"Proximal Decoding for LDPC Codes"* and *"Deep-Unfolded Sparse CDMA: Multiuser Detector and Sparse Signature Design,"* deeply resonates with my academic pursuits and career aspirations.

I am currently pursuing a Bachelor's degree in Computer Engineering at Savitribai Phule Pune University, where I have established a strong foundation in machine learning, deep learning, and optimization approaches. My courses in Probability and Statistics, as well as Machine Learning, have helped me comprehend mathematical models and their applications in computational problem solving.

During my Data Science Internship at Profcess, I helped build scalable data pipelines for time series forecasting and optimized models like XGBoost and SARIMA for better predictive accuracy. My hands-on experience includes signal processing and predictive modeling, as demonstrated by projects such as Pulsemate, a cardiology chatbot built with LLMs, and ImaginAIry, text-to-image generating software that uses Stable Diffusion XL. These projects, combined with my experience with tools such as TensorFlow, PyTorch, and PySpark, have prepared me to face issues in optimization and machine learning.

In addition, my Practical AI with Python certification reflects my ongoing commitment to developing my knowledge of AI and machine learning. Furthermore, my Japanese proficiency (JLPT N3) qualifies me as an ideal candidate to seamlessly integrate into your research environment and collaborate effectively in a Japanese academic setting.

What interests me the most about your lab is its emphasis on deep-unfolded algorithms for signal processing and optimization. I am particularly interested in the combination of gradient descent techniques and deep learning architectures, which I feel has enormous potential to improve the discipline. I am enthusiastic to contribute substantially to your research on optimization and resilient machine learning systems by leveraging my Python, TensorFlow, and computational modeling knowledge.

I would be honored to discuss my qualifications and potential contributions further. I look forward to the possibility of collaborating and learning under your esteemed guidance.

**Warm Regards,**

Krish Bakshi