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Subject: Application for the PhD Position
(Reference number PREUR00419 - H2020-CompBioMed2-Gianni de Fabritiis)

Dear Prof. Gianni De Fabritiis,

I am Ojas Singh, currently in the final semester of my BS-MS (chemistry) dual degree program at the Indian Institute of Science Education and Research Mohali. I am interested in the project regarding Machine Learning at the Computational Science Laboratory. I am writing this to express my sincere interest in joining your lab as a doctoral student this coming semester.

Presently, I am pursuing my master's thesis on Time-Dependent Configuration Interaction at my institute under the supervision of Dr. P. Balanarayan. Thus far, I have successfully implemented an efficient CI algorithm with high-performance data structures in Rust, which is the fastest implementation for our case. I am currently working on quantum dynamics using the $(t, t')method.$

In addition to this, I have also designed and developed a high-performance parallel python program for real-time image acquisition and processing. This resulted in fast magnetic bead movement tracking at the millisecond temporal resolution and nanometer spatial resolution. This implementation can process 3000+ frames per second, which is three times faster than industry leading software. I am familiar with Linux and version control systems such as Git. I am also proficient with coding in Python and Rust, along with using machine learning libraries such as PyTorch and TensorFlow. I am immensely interested in high-performance computing and in pushing the limits for what is feasible in terms of simulations.

I am looking forward to developing machine learning models for enhancing the accuracy of molecular simulation methods. I have perused a few of your publications and found your research quite intriguing. Having this prior experience as well as an inquisitive mind and flexibility to explore new horizons, I am genuinely excited at the prospect of working under your supervision in this project and firmly believe that I would be a valuable asset to your team.

Thank you for your time and kind consideration. I would be highly obliged to hear from you.

Sincerely yours,

Ojas Singh