

# Avi Bank

B.SC HONOURS · COMPUTER SCIENCE

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## The European Molecular Biology Laboratory - The European Bioinformatics Institute

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WELLCOME TRUST GENOME CAMPUS  
HINXTON, CAMBRIDGE CB10 1SD, UK

### Application for Systems Administrator (Job ID: EBI01464)

To whom it may concern,

I am currently a postgraduate student at the University of the Witwatersrand, South Africa. I will be completing my postgraduate studies in November. My first semester results indicate I shall finish cum-laude. My primary research interests are high performance computing, parallel programming and robotics. I was glad to be informed of your vacancy by David Macleoud, through Ray Coetzee.

I am a previous winner of the **International Student Cluster Competition**. Since winning the competition in 2016, I have retained an interest in HPC, playing an active role in the Centre for High Performance Computing's local student cluster competition. I have attended the CHPC annual meeting every year since 2015; either as a competitor (winning in 2015), attendant (2016) or mentor (2017, 2018). The role of a mentor entails training teams of students from one's university throughout the **local** competition. The teams I've coached have always placed within the top 3 of the competition, not to take away from their own achievements. To make things easier for me as well as my successor, I've created and maintained documentation for the training. Attending the conference/competition has kept me up to date with current research and development trends in the HPC field. It also allows me to catch up with what other previous winners have been doing and the HPC tools they are currently using. For example; a colleague introduced me to Singularity at last year's conference. My university has been very supportive of the competition. They have entrusted me with a large office, replete with a 20-node cluster used to train students participating in the competition as well as for my own research. The competition also gave me experience working with suppliers and vendors; while setting up our cluster at the international competition in Frankfurt, our Mellanox Infiniband switch was DOA. We had to ask Mellanox to send us a new switch. My team and I were able to organise a new one, shipped, the next morning! We also travelled to Texas to consult with Dell's HPC experts for our cluster design. We were able to use Dell servers with CPU's not yet on the market, after signing a thorough NDA.

Apart from the competition, I have recently completed an intense HPC course as part of my postgraduate degree. It was focused on parallel programming. I gained a solid foundation in CUDA, OpenMP and MPI paradigms as well as theoretical aspects of HPC. My **main project for the course** involved CUDA and MPI implementations of Simulated-Annealing as applied to the Travelling Salesman Problem. This required us to interact with our University's main research cluster. I have built a relationship with the system administrators via the competition, so sorting out environment issues was never a problem. However, when the HPC project required the use of Slurm many of my classmates did not seem able to use it - they were able to ssh directly into the cluster's compute nodes and run their jobs manually. Slurm did not seem to notice this and as a result, my experiments were off. This lead me to develop **a handy little tool** to catch people abusing the system and

avoid the busy nodes. As you can see, I am a big fan of automation and writing python/shell scripts. My postgraduate thesis involves writing multi-threaded and GPU based machine learning libraries, to accelerate automated machine learning frameworks. This is a collaborative effort with MIT, and involves a lot of remote communication that inevitably comes with contributing to open source projects.

Currently, I am the head tutor for a final year undergraduate **Operating Systems course**. I was specifically selected for this role by the course lecturer. I am responsible for creating and marking the practical lab assignments, which build up to writing a custom shell. I also manage a team of four other tutors. Since there are 181 students enrolled in this course, extensive automation on my part is required.

Working at EMBL-EBI, I would be able to help researchers with the requirements listed in the job specification. But more importantly, I hope to be able to offer advice on optimising their parallel code. I would no doubt benefit from the scientific and technical culture at the EMBL-EBI campus, something I'd miss working at a bank. Living a life dedicated to the scientific endeavour, it would seem, is a value I share with the members of this institution. The research opportunities tangent to this position makes this an amazing opportunity to start my professional career in HPC. I am a hard worker, often staying on campus late into the night, doing research. With a strong background in HPC, I would be happy to fulfil your requirements.

Thank you for considering my application. Further gratitude is due for clicking all the links. I hope to be selected for an interview. Should I be so fortunate, the best way to reach me would be through email: [avibank1@gmail.com](mailto:avibank1@gmail.com).

Unfortunately, due to the absurd amount of scam and robo-calls, I do not answer calls from unknown numbers. My apologies for any inconvenience caused by this.

Usually, I am available for interviews on Mondays, preferably between 8am and 11:59 am (SAST).

I look forward to hearing from you.

Sincerely,

Avi Bank