

Jehan Singh

Curriculum Vitae

Personal Details

- Name: Jehan Singh
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Personal Profile

I am an electrical and computer engineering graduate currently working in the field of embedded systems and industrial automation. In addition, I have had training and experience from work with the South African Centre for High Performance Computing. As part of this I competed in the International Super Compute Student Cluster Competition 2019 in Frankfurt, where my team and I placed first. This has given me experience working hands-on designing, setting up, optimizing and running high performance computing clusters. I have run Linux on a wide array of devices, including servers, desktops, laptops, and embedded systems, for the past five years. This has given me a great deal of experience automating, troubleshooting and configuring these systems. I am extremely passionate about high performance systems administration and I would greatly appreciate the opportunity to contribute my skills on an important international project like the EMBL, and expand my skills in the process.

Work Experience and Notable Projects

Embedded Systems Engineer at Enspara: 2020-present

- Developed monitoring and control solutions for reducing the energy consumption of industrial and commercial equipment
- Maintained and upgraded existing hardware and software including a custom embedded Linux image used on monitoring hardware
- Wrote documentation and manuals for hardware installations and software deployment
- Tools used: nodejs, node-red, python, bash, bitbake build system, git, AWS Things, Siemens PLC.

Winning Student Cluster Competition ISC 2019

- Competed in and won the ISC Student Cluster Competition 2019 as part of a team on behalf of the Centre for Scientific and Industrial Research
- Placed first out of 14 teams: [News Article](#)
- Designed, prepared, optimized and ran benchmarks and applications on a six-node, 336 core CentOS cluster.
- Underwent mentorship from the South African Centre for High Performance Computing as well as several days of learning from Dell and TACC Engineers.
- Built and optimized libraries for OpenMPI, HDF5, FFTW, PARMETIS and GSL using open source compilers and Intel Parallel Studio.
- Primary focus was on optimizing the SwiftSim Astrodynamics package and assisted in optimization for HPL, HPCC, HPCG, and OpenFOAM.
- Wrote scripts in bash and python to monitor and control the performance of the cluster.
- Reference: David Macleod dmacleod@csir.co.za

Penguin Data Collection Project 2018-2019

- Designed, programmed and integrated a Raspberry Pi based embedded system for collecting images and weight readings of endangered penguins on St. Croix Island in May 2019
- Developed python software which must be robust enough to run unchecked for up to six months and recover from failures.
- Integrated and adapted system hardware and software to survive harsh conditions and support other research goals.
- This was my undergraduate final project, my report and poster can be found [here](#) and [here](#).
- Reference: Justin Pead: justin.pead@uct.ac.za

Education

- 2021-present: Studying part-time towards a Masters of Science in Engineering in Micro and Nanoelectronics at the University of Johannesburg, with a research focus on graphene manufacturing processes for nanobiosensors.
- 2016-2020: Graduated with a Bachelor of Science in Engineering in Electrical and Computer Engineering from the University of Cape Town
- 2015: Graduated from Northcliff High School with 5 distinctions.

Undergraduate Vacation Work

Software intern at ABSA Aliens, 2018

Two-week placement, where I developed an Android app alongside two other students implementing an infrastructure-free local positioning system using existing wi-fi networks.

Security intern at MWR Information Security, 2017

Two-week training in webapp security, penetration testing with industry standard tools, and security best practices, including incident reporting skills.

Software intern at Journeyapps Stellenbosch, 2017

Three-week internship where I implemented a NodeJS API server which converted existing REST API's into GraphQL API's according to an XML API schema.

Skills

- Experience with Linux system administration and environment management across a variety of distributions and environments, including Linux cluster environments and web servers
- Experience using the programming languages and tools Python (including scientific computing packages), NodeJS, Lua, Pascal, and Linux Shell Scripting tools.
- Experience operating, monitoring and tuning massively parallel HPC computing environments
- Elementary skill with Ansible, SLURM, Grafana, Ganglia, and Lmod automation and management tools
- Elementary or Basic knowledge of C, Perl, Java, including some Android development, HTML, CSS, and SQL
- Competent user of both Microsoft Office programs and LaTeX document creation tools
- Significant experience with GNU/Linux Operating Systems on server, desktop and embedded environments
- Experience with a variety of Linux distributions including CentOS, Debian, Arch, Gentoo, and OpenSUSE
- Experience with electronic design including practical lab testing, soldering and wiring
- Elementary skill with VLSI layout, PCB layout, and SPICE simulation
- Capable of quickly learning about new tools or systems as needed
- Skill at working with technical equipment or documents and software manuals