Jehan Singh
Curriculum Vitae

Personal Details

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Personal Profile

I am an electrical and computer engineering graduate currently working in the field of embedded systems and automation. I am presently working towards a masters degree in nanoelectronics at the University of Johannesburg, with a focus on graphene manufacturing processes for biosensors. I am eager to expand my skills. I studied and worked on electronic design, particularly embedded system design, and in addition I have several years of experience and academic training in working with Linux systems, on desktops, embedded devices, and with high performance computing clusters. I can effectively combine these skills to take on problems ranging from automation to testing to hardware debugging, and I can provide effective solutions to problems.

Work Experience and Notable Projects

Junior 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
- Designed and tested automation and sensing hardware
- Wrote documentation and manuals for hardware installations and software deployment
- Operated independently to perform design and maintenance tasks on company IoT fleet
- 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 an embedded Linux based system for collecting images, RFID scans, and weight readings of endangered penguins on St. Croix Island.
- 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 rools, 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

- Programming languages and tools Python (including scientific computing packages), C (including for microcontrollers), NodeJS, Lua, Pascal, and Linux Shell Scripting tools.
- Linux system administration and environment management across a variety of distributions and environments, including Linux cluster environments and web servers
- Operating, monitoring and tuning massively parallely HPC computing environments
- Significant experience with GNU/Linux Operating Systems on server, desktop and embedded environments
- Elementary knowledge of Perl, Java, including some Android development, HTML, CSS, and SQL
- Elementary skill with 3D CAD in Inventor, SolidWorks, and FreeCAD, PCB layout in Altium, and SPICE simulation
- Elementary skill with Ansible, SLURM, Grafana, Ganglia, and Lmod automation and management tools
- Competent user of both Microsoft Office programs and LaTeX document creation tools
- Experience with electronic design including practical lab testing, soldering and wiring
- Capable of quickly learning about new tools or systems as needed
- Skill at working with technical equipment or documents and software manuals