

Mueen Nawaz

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Work Experience

INTEL CORPORATION

Software Developer

SEP 2020—PRESENT

- Automated the collection of software quality metrics across various databases. This tool provides program managers an overview of the state of a product and helped in discovering gaps in the databases.
- Used natural language processing techniques to help a customer find duplicates in their bug tracking tool.

Software Developer

AUG 2018—AUG 2020

- Wrote and cross compiled a set of programs to test the accuracy of the C Standard math library (math.h) on an embedded system.
- Shepherded the team's efforts to qualify an Intel library for use in autonomous vehicles. Became the team's expert in ISO 26262 compliance for this purpose.

Software Developer

FEB 2014—AUG 2018

- Developed and maintained a 0.5M line C++ code base that runs on Intel's testers in High Volume Manufacturing.
- Promoted the use of the C++ algorithms library to minimize wheel reinvention.
- Demonstrated how to rearchitect legacy code to allow for unit tests and mocking.
- Continually automated several manual workflows for testing and building.
- Guided team to better code testing practices.

Device Parameter Extraction Engineer

FEB 2010—FEB 2014

- Extracted compact model parameters from MOSFET data. Delivered to circuit designers process files for Intel's fabrication process nodes.
- Convinced several team members to use Pandas and the Jupyter Notebook for data analyses.
- Authored and maintained several tools in Python, Visual Basic and C. Examples:
 - Parallelized a tool that simulated several circuits, yielding a significant speedup.
 - Wrote an optimizer that tweaked the parameters of MOSFETs, with constraints, until targets were met.
 - Wrote a wrapper API around a device simulation API, simplifying the calculation of MOSFET characteristics, and allowing their use in the Scientific Python stack (e.g. NumPy). One colleague used it to replace a manual process and reduced what took an hour to 2–3 minutes.
 - Contributed to the open source pyOpt library.

UNIVERSITY OF ILLINOIS AT URBANA—CHAMPAIGN

Research Assistant: Department of Electrical and Computer Engineering

JAN 2003—MAY 2008

- Numerically computed carrier scattering in silicon nanowires.
- Coded phonon models in MATLAB, SCIENTIFIC PYTHON and C++.
- Graphically visualized phonons with a raytracer (POV-Ray).

Web programmer: Division of Disability Resources and Educational Services

MAY 2008—DEC 2009

- Replaced an existing (static) collaboration management web site with one that was dynamic to ease the administrator's work load, using the Django web framework.

UNIVERSITY OF IDAHO

Research Assistant: Microelectronics Research and Communications Institute MAY 2001—AUG 2001

- Numerically calculated electric fields for various devices using ANSOFT 2-D package.
- Surveyed available numerical libraries and implemented suitable algorithms into a finite difference solver.

Mathematics tutor at the Polya Mathematics Center JAN 2000—DEC 2002

- Tutored students in mathematics up to and including differential equations.
- Assisted with administering examinations and computer based instruction.

Education

UNIVERSITY OF ILLINOIS AT URBANA–CHAMPAIGN

M.S. in Physics Dec 2009.

M.S. in Electrical Engineering. Dec 2005.

Research topic: Semiconductor device modeling.

GPA: 3.76/4.00

UNIVERSITY OF IDAHO

B.S. in Electrical Engineering. Dec 2002.

Minors in MATHEMATICS and PHYSICS.

Graduated **Magna Cum Laude.**

GPA: 3.89/4.00

Interests

Machine Learning

Studies Took online courses in machine learning as well as one within Intel. Material covered included support vector machines, neural networks, perceptron, logistic regression, various tree based methods (CART, random forests, gradient boosting), bias-variance tradeoffs and handling overfitting, model selection, feature selection, clustering, principal component analysis.

Project Applied some tree based techniques on a project that aimed to predict the output of basic circuits (oscillators, gates, etc) based on the physical properties of the individual MOSFETs (e.g. threshold voltage, capacitance, etc). I identified potential features, and ran 12 million circuit simulations to gather the data needed for machine learning.

Technical Skills

Computer Languages	Python, C++, C, MATLAB, BASIC
Computer Software	SciPy, NumPy, pandas, Jupyter, Django, L ^A T _E X 2 _ε , Mercurial, Git, POV-Ray
Operating Systems	Linux/UNIX, Windows, DOS
Recent & Related	F#, Haskell, Scheme/Lisp, Machine Learning, MPI
Interests	Statistics, machine learning, numerical computation, programming, physical modeling, physics, pure mathematics, number theory

Publications

- “Confined Optical Phonon Scattering in p-Silicon Nanowires”, M Nawaz, JP Leburton, 65th Annual IEEE Device Research Conference, 2007.
- “Hole scattering by confined optical phonons in silicon nanowires”, M Nawaz, JP Leburton, J Jin, *Applied Physics Letters*, 90, 183505, 2007
- “Optic Phonon Limited Hole Mobility in Silicon Nanowires: Continuous vs Quantized Modes”, M Nawaz, MS thesis, Electrical Engineering, University of Illinois at Urbana–Champaign, 2005