Divas Subedi

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Education

B.S. in Physics and Engineering (concentration in Computer Engineering)

Expected May 2022

Trinity College — *Hartford, CT, USA*

- Cumulative GPA: 4.1 / 4.0

Honors

- Thomas Holland Scholar
- The Albert J. Howard Jr. Prize
- Engineering Junior Book Prize
- Theodore R. Blakeslee II Award
- Phi Gamma Delta Prize in Mathematics
- President's Fellow for Physics
- Sigma Pi Sigma Honor Society
- Faculty Honors

Relevant Courseworks

- Quantum Mechanics
- Abstract Algebra
- Applied Linear Algebra
- Partial Differential Eqn
- Data Structure & Algorithm
- Probability Theory
- Intro to Computer Systems
- Electrodynamics

Experience & Training

Intern

May 2021 - Aug 2021

Fermi National Accelerator Laboratory — *Batavia, IL, USA*

- Designed and coded firmware for ground impedance monitor for isolation of ground for DUNE-LBNF far side detector.
- Implemented signal processing models in FPGA for impedance monitoring.
- Created and managed code-base for circuit element parameter optimization using LTSPICE and Python.
- Presented poster and oral presentation for the project at 2021 Fermilab SIST Symposium.

Trainee

May 2021 - Aug 2021

University of Waterloo: Institute of Quantum Computing — *Waterloo, ON, Canada*

- Participated in USEQIP to study quantum algorithms and multiple aspects of experimental quantum computing.

Teaching Assistant

Jan 2020 - Present

Trinity College — *Hartford, CT, USA*

Assisted in management of courses, conducted labs, graded assignments, and presented supplementary lectures.

- ENGR 110 : Engineering and Analysis
- ENGR 120 : Introduction to Engineering Design
- ENGR 212 : Linear Circuit Theory
- PHYS 231 : Physics II: Electricity, Magnetism and Waves
- PHYS 141 : Physics I: Mechanics
- CPSC 203 : Mathematical Foundation of Computing

Research Projects

Vibration-based Contact Sensing [C3-4]

May 2020 - Sep 2021

Trinity College Department of Engineering — *Hartford, CT, USA*

- Designed and built vibration-based contact sensor using accelerometer with C.
- Implemented signal processing and convolutional neural network using MATLAB and Python to classify contact location.
- Presented the paper at IEEE/SICE International Symposium on System Integration (SII), Narvik, Norway, 2022.

Haptic Interface for Robot Locomotion[J1]

Sep 2020 - Dec 2020

Trinity College Department of Engineering — *Hartford, CT, USA*

- Developed haptic telelocomotion interface with a hexapedal robot using Python and Chai3D.
- Implemented gait trajectory using haptic device configuration and generated appropriate force feedback.

Vision-based force-feedback in RMIS [C2]

Jan 2020 - Mar 2020

Trinity College Department of Engineering — *Hartford, CT, USA*

- Examined the performance of haptic feedback in Robot-Assisted Minimally Invasive Surgery using simulated tissue.
- Developed mathematical models for node-to-node interaction within mesh used for modeling tissue surfaces.
- Implemented statistical models to analyze user study data using R.

Semiconductor Device Modeling [C1]

May 2019 - Aug 2019

Trinity College Department of Engineering — *Hartford, CT, USA*

- Simulated and evaluated characteristics of MOSFET and FIBMOS with varying channel properties using COMSOL.
- Presented the paper at COMSOL Multiphysics Conference 2019, Boston, MA.

Software Projects

FermiLT Designed and maintained circuit element optimizer for Fermilab. Python (SciPy)/SPICE

QHO Simulator Designed a simulator to estimate time evolution of a given quantum wave function. MATLAB

Quantum full adder Designed quantum analogue of full bit adder. Python (Qiskit)

Cubetastic Built 3D collision-based obstacle avoidance game for Android and Windows. Unity/C#

Text Editor Implemented Search Tree to build a text editor with text prediction. Java

Project Map Built global air traffic map by implementing various data structures. Java

Skills

Programming Python (SciPy, TensorFlow, Qiskit, Pandas), MATLAB, C, C++, R, Mathematica, C#
Tools Jupyter, SPICE, COMSOL, Git, ROS, LaTeX, RStudio, Unity3D
Languages English, Nepalese, Hindi

Leadership & Activities

President Trinity College IEEE Student Chapter *Jan 2020 - May 2021*
Treasurer Trinity College SPS Chapter *Sep 2019 - Present*
Mentor IEEE TryEngineering *Jan 2020 - May 2020*
Member Trinity College Habitat for Humanity *Sep 2020 - Present*

Publications

Conference Publications

[C4] **D. Subedi**, E. Schoemer, D. Chitrakar, Y. Su and K. Huang, "Contact Location via Active Oscillatory Actuation", *2022 IEEE/SICE International Symposium on System Integration (SII)*, Narvik, Norway, 2022.

[C3] R. Mitra, K. Boyd, **D. Subedi**, D. Chitrakar, E. Aldrich, A. Swamy, and K. Huang, "Contact Sensing via Active Oscillatory Actuation", *2020 IEEE International Conference on Mechatronics, Robotics and Automation (ICMRA)*, Shanghai, China, 2020.

[C2] K. Huang, D. Chitrakar, R.Mitra, **D.Subedi**, and Y. Su, "Characterizing Limits of Vision-Based Force Feedback in Simulated Surgical Tool-Tissue Interaction", *2020 Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, Montreal, Canada, 2020.

[C1] **D. Subedi** and D. A. Fixel, "MOSFET Channel Engineering and Scaling Study using COMSOL Multiphysics Simulation Software", *COMSOL Multiphysics Conference 2019*, Boston, MA, 2019.

Journal Publication

[J1] K. Huang, **D. Subedi**, R. Mitra, I. Yung, K. Boyd, E. Aldrich, and D. Chitrakar, "Telelocomotion—Remotely Operated Legged Robots", *Applied Sciences 2021*, vol. 11, no. 1:194.

Technical Reports

[T1] **D. Subedi**, M.J. Utes, P.M. Rubinov, "GIZMo for DUNE at LBNF", *Fermilab Summer Internships in Science & Technology (SIST)*, Batavia, IL, 2021.

In preparation

[T2] **D. Subedi**, "LTSpice Circuit Element Optimizer", collaborating with Fermilab in preparation for *IEEE-USA White Paper*

Presentations

[P3] "Contact Location via Active Oscillatory Actuation", *2022 IEEE/SICE International Symposium on System Integration (SII)*, Narvik, Norway, January 9, 2022.

[P2] "GIZMo for DUNE at LBNF", *Fermilab Summer Internships in Science & Technology (SIST)*, Batavia, IL, August 9, 2021.

[P1] "MOSFET Channel Engineering and Scaling Study using COMSOL Multiphysics Simulation Software", *COMSOL Multiphysics Conference 2019*, Boston, MA, October 2, 2019.