Nirajan Koirala

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https://n7koirala.github.io/

EDUCATION

Doctor of Philosophy (4.00/4.00 GPA), Computer Science and Engineering
University of Notre Dame (Notre Dame, IN)   June 2021 - May 2025

Master of Science (3.79/4.00 GPA), Computer Science
Villanova University (Villanova, PA)   Aug. 2019 - May. 2021
Thesis: *Adversarial Attacks against Deep Neural Networks*

Bachelor of Science (3.75/4.00 GPA - Magna Cum Laude), Mathematics and Computer Science
Troy University (Troy, AL)   Aug. 2015 - May 2019

COURSEWORK AND SKILLS

Computer Science: Cryptography and Network Security, Computer Networking, Operating Systems, Computer Architecture/Organization, Design and Analysis of Algorithms, Data Structures and Algorithms, Theory of Computing, Machine Learning, Deep Learning, High Performance Computing, IoT

Mathematics: Abstract Algebra, Topology, Real Analysis, Axiomatic Geometry, Applied Discrete Mathematics, Linear Algebra, Calculus I-III, Differential Equations, Statistics Methods and Computations, Statistics I and II

Languages and Tools: C++, Python, Java, Microsoft SEAL, PALISADE, HEAAN, Git, Linux, gdb, LaTeX, TensorFlow, SQL, PHP

Foreign Languages: Nepalese (native), Hindi (fluent)

HONORS AND AWARDS

University of Notre Dame (Notre Dame, IN)
University Fellow (Fellowship offered by the Department of Computer Science and Engineering, 2021)

Villanova University (Villanova, PA)
Upsilon Pi Epsilon (Computer Science Honor Society), 3MT finalist

Troy University (Troy, AL)
Chancellor's List (2018, 2019), Provost's List (2016, 2017), Pi Mu Epsilon (Mathematics Honor Society), Chancellor's Scholarship (full-tuition scholarship)

PROJECTS

Profiling of Homomorphic Encryption Libraries. Computer Science and Engineering Department, University of Notre Dame.
- Performance evaluation of different fully homomorphic encryption libraries for primitive operations and application level tasks
- Libraries profiled include Microsoft SEAL, PALISADE, HEAAN, HElib

Implementation and Performance study of Advanced Encryption Standard. Electrical and Computer Engineering Department, Villanova University. Link: `bit.ly/AESproject0`

Applications of Deep Learning Methods in Autonomous Driving Systems. Department of Computing Sciences, Villanova University.
Link: `bit.ly/autonomous_driving_dl`

WORK EXPERIENCE

Graduate Research Assistant June 2021 - Present
University of Notre Dame (Notre Dame, IN), Department of Computer Science and Engineering
- Conducted research in areas including fully homomorphic encryption, and Trusted Execution Environments.
- Collaboration with Duality Technologies, Cryptolabs.

Graduate Teaching Assistant Aug. 2021 - Present
University of Notre Dame (Notre Dame, IN), Department of Computer Science and Engineering
- Held office hours, graded assignments, and proctored examinations.
- Courses include CSE 40622 (Cryptography) and CSE 40113 (Design/Analysis of Algorithms).

Graduate Research Assistant Aug. 2019 - Jan. 2021
Villanova University (Villanova, PA), Department of Computing Sciences
- Researched under the technical area team for secure configurations to build and integrate new tools with ConSec System
- Tools used: Python, Prolog, Ptolemy II, ConSec Common Modeling Language (CCML)

Software Engineering Intern May 2021 - Aug. 2021
Crane Payment Innovations (Malvern, PA)
- Built a WPF-application to handle communications with IoT payment devices
- Developer on the front/back-end responsible for designing the main architecture of application
- Technologies used: C#, Python, Testuff API, Node.js, AES Encryption

Computer Science Tutor Aug. 2018 - May. 2019
Troy University (Troy, AL), Department of Computer Science
- Responsible for the proper operation of Computer Science Lab
- Tutored freshman and sophomore students for Computer Science courses (Computer Science I and II, Nature of Programming Languages).

Web Developer Intern May 2018 – July 2018
ALFA Insurance (Montgomery, AL)
- Deployed a mobile application to be used by insurance agents which decreased the quote providing time by 75%.
- Developer on front/back-end, DBA and QA positions.

EXTRA-CURRICULAR ACTIVITIES

University of Notre Dame (Notre Dame, IN)
Participating in Bengal Bouts 2022
Book Club (2021-Present)

Villanova University (Villanova, PA)
Graduate Student Ambassador

Troy University (Troy, AL)
Volunteered at the Troy University BEST Robotics Kick Off
Active member of the Computer Science Club and the Square Root C Math Club

Organized various events through Troy Nepalese Student Association
Played for the Troy's Men Soccer Club (Troy FC)