DEV SINGH

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SUMMARY

Sophomore in Computer Science at the University of Illinois Urbana-Champaign seeking an industry or research position to build technical and professional skills. Experienced in backend engineering and machine learning, with research in computer vision and active/semi-supervised learning. 6 years of programming experience, mainly in Python, Javascript, and C++. Proficient with Git/GitHub, Linux, LaTex, and PyTorch. Strong software engineering background, including custom application development and deployment. Strong mathematical background, including multi-variable calculus, linear algebra, real analysis, and statistics.

EDUCATION

University of Illinois (Grainger College of Engineering) – Champaign, IL *August 2022 - May 2025*
B.S in Computer Science GPA: 4.0/4.0

- Minor: Business
- Relevant coursework: Data Structures, Computer Architecture, Numerical Methods, Discrete Structures, Probability and Statistics, Theory of Algorithms.

Illinois Mathematics and Science Academy – Aurora, IL *August 2019 - June 2022*
High School Diploma GPA: 3.95/4.0

- Relevant coursework: Multivariable Calculus, Linear Algebra, Real Analysis, Machine Learning.
- Tutored other students in various programming languages and machine learning concepts, along with mathematics and science.
- Participated in Math team and competed in the AreteLabs national competitions, where I contributed to the team becoming one of the top 16 teams in the nation.

WORK AND PROJECT EXPERIENCE

Caterpillar Inc. – Chicago, IL *May 2023 - Aug 2023*
Digital and Analytics Intern

- Worked on the Analytics Execution Team in the Cat Digital division of Caterpillar to develop tools for the Cat Helios product.
- Developed MLOps tools on an Agile team to facilitate the validation and deployment of ML models.
- Integrated automated code scanning and analysis tools into existing pipelines to reduce security hotspots.
- Leveraged AWS Lambda, S3, DynamoDB, CloudFormation, and API Gateway to create a distributed model cleanup and testing tool.
- Used parallel processing to increase the speed of the anomaly processing and alerting system by 45%.

Zakti Security Labs – Naperville, IL *May 2019 - April 2023*
Software Engineering Intern

- Developed and deployed custom, client-focused solutions for high-risk businesses that increase work efficiency, provide cyber-security resilience, improve regulatory compliance, and facilitate secure exchange of confidential data under significant time constraints.
  - Analyzed HIPAA compliance with telemedicine and online platforms for clients.
  - Identified mitigation strategies for potential HIPAA violations.
  - Performed research into the most attacked services on corporate networks to reinforce protection of these services.

  - Created analysis tools to prevent unauthorized disclosure of confidential information.
  - Developed encrypted information sharing portal for corporations to ensure compliance with data security requirements.

Text Information Management and Analysis Group – Champaign, IL *September 2020 - August 2022*
Student Researcher

- Conducted research with a high degree of autonomy at UIUC regarding active and semi-supervised learning, data sparsity, domain shift and lack of annotations to improve Deep Learning models for real-world scenarios.
- Worked to increase the accuracy and reduce the computational requirements of video classification tasks using self-supervised video transformer networks by designing a contrastive, multi-modal video transformer network.
- Advised by Prof. Chengxiang Zhai, UIUC and Prof. Ismini Lourentzou, Virginia Tech.

Kilpi LLC – Naperville, IL *March 2021 - Present*
Co-Founder and CTO

- Create a SaaS fax-replacement platform that enables highly-regulated businesses to accept sensitive information over the internet.
- Implemented end-to-end encryption using public-key cryptography.
- Deployed application to AWS and Oracle high-availability environments for 99.99% uptime of all end-user applications.

Epoch @ IMSA – Aurora, IL *August 2019 - June 2022*
Co-Founder and CTO

- Led and trained a team of 20 students to create a new CUDA-enabled HPC cluster.
- Oversee technological vision and overall reliability of the HPC cluster at both the hardware and software levels.
  - Leveraged automation technologies, including Canonical MaaS and Ansible, to enable deployment of nodes in under 30 minutes.
  - Implemented a production-grade SLURM cluster on a bare-metal cloud to provide 99.5% uptime resources to users.
  - Designed and deployed a cluster with more than 20 nodes and 600 TFLOPS of CUDA-accelerated resources.
- Contributed to various upstream open-source projects to improve the automated deployment of the SLURM job management software and other HPC software.
- Coordinated with IMSA staff, administration, Board members, and other key stakeholders.
- Worked with IMSA staff to write and improve Computer Science and Machine Learning curriculum.

Titan Robotics – Aurora, IL *August 2019 - June 2022*
Head of Strategy and Application Development

- Created cross-platform application to facilitate scouting data collection at FIRST robotics competitions.
  - Design mobile app, backend API, and data analysis engine using React.JS, Node.JS, scikit-learn, PyTorch, and MongoDB.
  - Deployed to Amazon Web Services Elastic Kubernetes Service.
- Led and trained team of 7 students to maintain and document all projects.
- Used PyTorch and sklearn to analyze FIRST robotics competition data and predict match outcomes with other team members.
  - Deployed at the 2020 Midwest Regional Competition, directly enabling the team to win the competition through team metric calculation, movement analysis, and risk-reward analysis.

Mozilla Firefox – Naperville, IL *May 2020 - August 2020*
Contributor

- Wrote bugfixes and features for the Firefox DevTools component, resulting in higher developer efficiency and faster development cycles for developers using Firefox.

PUBLICATIONS AND WHITEPAPERS

Singh, D. & Setty, K. (2019). *Insights Into Patient Privacy and Online Reviews* [White paper]. *Zakti Security Labs.*

SKILLS AND INTERESTS

- **Concepts**: Deep Learning; Computer Vision; Semi-supervised learning; Natural Language Processing
- **Languages, Frameworks, and Platforms:** Python; C++; PyTorch; Node.JS; Canonical MaaS/JuJu; HTML/CSS/JS; Chef; Ansible; Linux; MongoDB; Latex;

ACCOMPLISHMENTS AND ACCOLADES

- Illinois State Scholar - 2022.
- Competition Finalist, FIRST Robotics Competition Midwest Regional - 2022.
- National Merit Semifinalist - 2021.
- US Provisional Patent Recipient, #63/130,629, External Portable Module for Secure Long-Range Communication using WiFi technology - 2020.
- Competition Champion, FIRST Robotics Competition Midwest Regional - 2020.
- Winner, Teens Take on COVID Hackathon - Best Future Impact category - 2020.
- 2nd place, Network Design Competition, Illinois Business Professionals of America - 2019.
- 3rd place, Computer Security Competition, Illinois Business Professionals of America - 2019.
- US Provisional Patent Recipient, #62/786,693, Process of Determining the Reliability and/or Accuracy of User-Produced Content - 2018.
- Recipient, Outstanding Hacker Scholarship, Hack Chicago - 2018.