

# PRAGYA SHARMA

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**Summary:** Ph.D. Candidate in Computer Engineering with 4+ years of research experience in 5G/6G systems, network security, and applied AI/ML for wireless networks. Seeking Research Scientist/Engineer roles to design next-generation wireless systems.

## EDUCATION

**Virginia Tech** | Arlington, Virginia, USA Jan 2021 – May 2026 (anticipated)  
*Ph.D. in Computer Engineering* GPA: 4.0/4.0

**Indian Institute of Technology Bombay** | Mumbai, India Jul 2013 – Jun 2018  
*B.Tech. & M.Tech. in Electrical Engineering* GPA: 8.36/10.0

## WORK EXPERIENCE

**Futurewei Technologies** | Addison, Texas, USA May 2025 – Aug 2025  
*Wireless Research Intern – 5G Advanced/6G System Architecture*

- Designed and proposed novel enhancements to the 6G core network architecture, enabling QoS-aware sharing of beyond-connectivity services (e.g., sensing) between local subnetworks.
- Formulated a QoS-aware optimization problem for service function selection in sensing-as-a-service use case; simulations demonstrated superior performance of the optimal solution over priority-only selection baseline.

**Kryptowire Labs** | McLean, Virginia, USA May 2022 – Aug 2022  
*Research & Development Intern*

- Deployed WAVE, a decentralized authorization framework, on a Kubernetes cluster and conducted stress-testing experiments to assess the scalability of the distributed system under constrained resources.
- Evaluated the performance of WAVE to propose and further integrate the framework as an authorization mechanism in the 5G core network.

**Cadence Design Systems** | Pune, India Jul 2018 – Dec 2020  
*Design Engineer II*

- Developed standardized libraries for Tensilica FixedPoint and FloatingPoint MathX Digital Signal Processors (DSPs) and optimized the code to achieve best possible performance of the DSPs.
- Improved DSP core performance by optimizing the Instruction Set Architecture (ISA) of Tensilica ConnX DSPs, benchmarking performance improvements across GCC and LLVM C-compilers.
- Contributed to the development of the neural network (NN) library of the Tensilica HiFi4 DSP to enhance Automatic Speech Recognition (ASR) capabilities of voice-controlled digital assistants.

## PUBLICATIONS

1. **Towards xApp Conflict Evaluation with Explainable Machine Learning and Causal Inference in O-RAN**  
P. Sharma, S. Sun, S. Deshpande, A. Stavrou, H. Wang  
*Accepted at IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN) 2025*
2. **Enabling QoS-Aware Beyond-Connectivity Service Sharing in 6G Local Networks**  
P. Sharma, A. Xiang, A. Kiani, J. Kaippallimalil, T. Saboorian, H. Wang  
*[Under Review]*
3. **5G-WAVE: A Core Network Framework with Decentralized Authorization for Network Slices**  
P. Sharma, T. Atalay, H. Gibbs, D. Stojadinovic, A. Stavrou, H. Wang  
*IEEE INFOCOM 2024 - IEEE International Conference on Computer Communications*
4. **FedMADE: Robust Federated Learning for Intrusion Detection in IoT Networks Using a Dynamic Aggregation Method**  
S. Sun, P. Sharma, K. Nwodo, A. Stavrou, H. Wang  
*ISC 2024 - Information Security Conference*

5. **Adaptive Flow-Level Scheduling for the IoT MAC**

P. Sharma, J. Nair, R. Singh

COMSNETS 2020 - International Conference on COMMunication Systems & NETWORKS

**TECHNICAL SKILLS**

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**Programming Languages:** C, C++ , Python, Bash (Linux)

**AI/ML Frameworks:** scikit-learn, PyTorch, Gymnasium, DoWhy

**Network Simulation and Analysis:** OpenAirInterface (OAI), MATLAB, Wireshark

**Other Platforms and Tools:** Kubernetes, Docker, Gurobi

**RESEARCH PROJECTS**

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**Conflict Evaluation of xApps in 5G O-RAN near-real-time RIC**

- Proposed a framework for conflict evaluation among xApps by combining explainable ML (SHAP) and causal inference to evaluate the causal relationships between xApp control actions (RCPs) and network KPIs.
- Measured the network impact of potential conflicts using metrics such as Average Treatment Effect (ATE) and Conditional Average Treatment Effect (CATE) of xApp RCPs on network KPIs.

**5G-WAVE: Decentralized Authorization of Network Functions (NFs) in 5G core**

- Designed a decentralized authorization framework for service access among NFs in the 5G core service-based architecture to eliminate security vulnerabilities caused by OAuth-based central authorization.
- Implemented the 5G-WAVE design by modifying OpenAirInterface (OAI) 5G core NFs deployed on a Kubernetes cluster and evaluated the framework's scalability by measuring latency in multi-slice deployments.

**Federated Learning-based Intrusion Detection in IoT Networks**

- Co-designed a dynamic aggregation method within the federated learning framework to address data heterogeneity from varying device vulnerabilities, significantly improving attack classification accuracy on real-world IoT traffic datasets.

**AWARDS AND ACHIEVEMENTS**

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**Pratt Fellowship**, ECE, Virginia Tech (2024)

**Student Travel Grant**, IEEE INFOCOM (2024)

**Institute Organizational Color**, IIT Bombay (2016)

**All India Rank (AIR) 192**, out of 1.4 million candidates in the IIT-JEE Advanced Exam (2013)

**LEADERSHIP ROLES**

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**Campus Representative, Arlington** (2022)

*Virginia Tech Graduate Student Assembly (VT-GSA)*

- Advocated for VT Arlington graduate students by conveying their concerns to the Graduate School and driving campus engagement initiatives.

**President, Washington DC Chapter** (2022–24)

*IIT Bombay Heritage Foundation (IITB-HF)*

- Led a 5-member executive board to strengthen alumni engagement through networking and community events.

**ACADEMIC SERVICES**

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**Reviewer**

- Journal of Computer Security 2024, 2025
- ESORICS 2024
- IEEE ICDCS 2024

**Teaching Assistant**

- Computer and Network Security Fundamentals, ECE, Virginia Tech (Spring 2021 & Fall 2021)