YOGITA PIMPALKAR
Research Scholar, IIIT, Bangalore

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Skills

- C, C++
- Python,
- IPsec, IKE, IKE2
- Cryptographic algorithms
- TCP/IP,
- SDWAN
- 5G/6G

Research Experience

Research Scholar, IIIT, Bangalore (1st Aug 2022 – present**)**
Research interests focus on IoT networks, network slicing, and advanced 5G technologies. Key contributions include:

- Identifying novel attack vectors on cloud container-based IoT systems and proposing mitigation strategies (IEEE CONECCT 2023).
- Developing a 6G path selection algorithm to enhance QoS and QoE (accepted by IEEE Transactions on Network and Service Management).
- Proposing AI-IoT-Guard for zero-day attack detection using Generative AI (to be submitted to IEEE IoT Journal).
- Winning Best Paper and Best Track Awards (IEEE CONECCT 2023).
- Filing two patents: one for detecting IoT cloud attacks and another for optimizing O-RAN slicing throughput

Industrial Experience

- **Senior software engineer at Cisco Systems**
  (9th Aug 2017 – 31st Sep 2021)
  Development, Automation, Performance testing, and Support for various IPsec and SDWAN projects.
- **Tech Lead** at **Infosys India Ltd**
  (28th Jul 2014 – 31st Jul 2017)
  Lead a team of three and managed the work for the IPsec project.
- **Senior software engineer** at **Tech Mahindra Ltd**
  (22nd Sept 2004 -16th Nov 2009)
  Lead the team of four , designed and developed different Alcatel SSG platform features and enhancements.

Education

Post-Graduation (CGPA :3.35)	**MS by Research (**2022-present) International Institute of Information Technology-Bangalore
Post-Graduation Diploma (Distinction)	**PGDBA Finance** (2012-2014) Symbiosis Institute, Pune.
Graduation **(71.33% Distinction)**	BE Information Technology (2000- 2004) P.E.S. College OF Engineering, Maharashtra

Honors-Awards

- Received **'You Amaze'** Rewards for various projects at Cisco.
- **'Infosys Insta'** award in 2016 And 2017 for all-around contributions to Organization and Client projects.
- **'Pat On the Back'** award in 2009 for exceptional contribution to Gateway Screening Projects at TechMahindra.

Key Projects

1. **Performance Testing for SDWAN Features**
   Design and Develop Python Automation to capture maximum performance bandwidth for different features like AppQoE, Appnav, DRE, SSLPROXY, UTD on all supported platforms.

2. **SSLPROXY on Cisco SDWAN solution**
   The SSL/TLS Proxy feature allows you to configure an edge device as a transparent SSL/TLS proxy. Such proxy devices can then decrypt incoming and outgoing TLS traffic to enable their inspection by Unified Threat Defense (UTD) and identify risks that are hidden by end-to-end encryption. My contribution includes design and development of the management layer for stats collection and controller integration. Created YANG models for configuration and operational purposes. Performed unit and integration testing of developed modules.

3. **IPsec Data path accelerator and Control plane**
   Enhancement and support for various data path and control plan IPsec solutions. Stabilization of ISM accelerator card and IPsec Switching components for ISRg2 Platforms.

4. **Cisco Dynamic Application Policy Routing**
   DAPR is an egress traffic engineering solution that dynamically steers flows based on application policies for both fixed and variable-rate interfaces. It monitors link utilization and application bandwidth requirements, redirecting traffic to underutilized links to optimize WAN usage. My contribution includes designing and developing user CLI configuration, operational modules for stats, infra-APIs, subblocks, and debugs. Performed unit and integration testing for all modules.

5. **Gateway Screening Range Expansion**
   Prior to this feature there was no method to automatically combine/split point code ranges in the Gateway Screening tables, without completely deleting and reassigning the entries.
   Fully carry out all the product life cycle from planning to give the load to customer. Designed and implemented feature code and carried out the Unit testing.

6. **Origin Based Routing**
   With the Origin Based Routing capability, in addition to the destination parameters, parameters related to the originating user can also be used to determine the route. As a result, two or more routes can be used at the same time to reach the same destination.
   Involved in design and implementation of Database Prepared UTR (Unit test cases) and carried out the unit testing.

Honors-Awards

- **'Best Track Award'** at IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT). IEEE, 2023.

- **'Best Paper Award'** at IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT). IEEE, 2023.

Publications

Conference Papers:

- Y. Pimpalkar, S. Ravindran, J. Bapat and D. Das, "New Attacks on Cloud Container-Based IoT Systems in 5G-Advanced and Beyond," 2023 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bangalore, India, 2023, pp. 1-6, doi: 10.1109/CONECCT57959.2023.10234780.

- S. Ravindran, Y. Pimpalkar, J. Bapat and D. Das, "Multi-User Service Through-put Estimation for Adaptive Resource Management in 5G-Advanced and BeyondSliced Networks," 2023 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), Bangalore, India, 2023,pp. 1-6,doi:10.1109/CONECCT57959.2023.10234812. Best Paper and BestTrack Award in the above conference.

Transactions and Journal:

- Y. Pimpalkar, S. Ravindran, J. Bapat and D. Das, "A Novel E2E Path Selection Algorithm for Superior QoS and QoE for 6G Services", accepted manuscript to IEEE Transactions on Network and Service Management.

Patent Application Numbers

• Patent Application No. 202441057669
TITLE: SYSTEM AND METHOD FOR DETECTING CLOUD CONTAINER-BASED ENERGY DEPLETION AND SYNERGISTIC POWER ATTACKS IN AN IOT NETWORK
Date of Filing: 30/07/2024

• Patent Application No. 202441057670
TITLE: SYSTEM AND METHOD FOR ESTIMATING AND OPTIMIZING THROUGHPUT IN O-RAN SLICING ENVIRONMENT
Date of Filing: 30/07/2024