

## RITU PANDE

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### Profile

Technology principal, specializing in applied cryptography, public key infrastructure and security architecture for connected embedded devices. Experience in technically building and mentoring large teams to take a product/service from conceptualization/pre-sales to production.

I am also an independent researcher, collaborating with experts in academia. My research interests include:

- Graph Neural Networks
- Group Convolutions
- Self-Organizing Systems

For more information, please refer [ritupande.github.io](http://ritupande.github.io)

### Research Experience:

- Publications
  - Hierarchical Neural Cellular Automata,  
R Pande, D Grattarola  
Artificial Life Conference (ALife 2023) | [Paper](#), [Code](#), [Talk](#)
- Projects
  - Adaptive Traffic Signal Control using Deep Reinforcement Learning. [Code](#)
- Skills
  - Tensor Flow, Numpy, Python, Object Oriented Programming
  - Self-organizing systems, Neural Cellular Automata, Deep Learning, Deep Reinforcement Learning, Graph Neural Networks
- Certifications.
  - [Natural Language Processing Specialization](#)
  - [AI for Medicine](#)
  - [Mathematics for Machine Learning](#)
  - [Deep Learning Specialization](#)
  - [Reinforcement Learning Specialization](#)
- More info: [ritupande.github.io](http://ritupande.github.io)

### Professional Experience:

- Employment

Company	Designation	Duration
General Motors	Software Architect, Technology Lead	Oct 2014 – Till date
Capgemini Group/ Altran Group/ Aricent Technologies/ Hughes Software Systems	<ul style="list-style-type: none"><li>○ Director Technology</li><li>○ Principal Systems Engineer</li><li>○ Senior Technical Lead</li><li>○ Technical Lead</li><li>○ Senior Software Engineer</li></ul>	July 2004 - Oct 2021
Wipro Technologies	Software Engineer	Oct 2002-July 2004
Innodata Information Technologies	System Engineer	Aug 2001 – Sept-2002

- Recent Projects

- **General Motors connected car infotainment (2014- Till Date).**

- Lead Security Architect responsible for:**

- Authoring PKI specification for all connected automotive ECUs capturing procurement, renewal and revocation strategy of device end-entity certificates.
      - Authoring Secured Onboard Communication (SecOC) specification for automotive infotainment ECU.
      - Authoring specification for flexible key provisioning for automotive infotainment ECU at plant and assembly.
      - Designing strategy for integration of automotive ECU key store with trusted applications in Qualcomm Trusted Execution Environment.
      - Designing ECU trusted certificate store strategy.
      - Designing integration of GM developed security components with the communication protocol stacks ( SOME/IP, TLS) in the ECU OS.
      - Mentoring and training implementation teams on security and applied cryptography fundamentals.
      - Leading end-to-end integration of the security features between connected infotainment ECU and the back-end servers.
      - Threat modelling for attack vectors on automotive connected ECUs.

- Lead Power and State Management Architect, responsible for:**

- Authoring specification for power and state management for automotive infotainment ECU
      - Technically leading implementation teams within General Motors and Tier-I suppliers to implement the power and state management functionality across SoC and Vehicle Interface Processor in automotive infotainment ECU.
      - Leading overall architecture integrating of power, thermal and voltage management
      - Spearheading triaging and execution
      - Triaging vehicle manufacturing and assembly issues in the SW domain.

- **Nokia Siemens Network(NSN) Femto Access Point (FAP) ( 2013- 2014)**

- Project Technical lead for the design and execution of security solution in FAP device.**

- Designing the Trusted Execution Environment strategy in FAP using ARM Trustzone architecture.
      - Technically leading the porting and integration of Aricent developed LTE stacks on SoC vendor's (Broadcom) BSP.
      - Designing and leading execution of integration and optimization strategy of ciphering at LTE air interface with SoC provided HW accelerators.
      - Leading the integration of encryption in the IPSec layer of Linux kernel with SoC provided HW accelerators.
      - Technically leading the design and execution of integration of Strongswan Internet Key Exchange version 2 (IKEv2) stack on Linux operating system with FAP fast path.
      - Designing and leading execution of secure boot strategy for FAP
      - Leading the execution of strategy for secure over-the-air download and subsequent flashing of firmware.
      - Designing the IP filter rules for implementing NATing in the FAP device.

## **Nokia Siemens Network (NSN) Flexi-Edge Base Transceiver Station ( BTS) ( 2009-2013)**

### **Feature Lead for design and execution of security and transport solutions for the Base Transceiver Station**

- Technically leading the design and execution of integration of Strongswan Internet Key Exchange version 2 (IKEv2) stack on QNX operating system with fast path executed in network processor.
- Technically leading the architecture, design and execution of CLM strategy for procurement, renewal and revocation of device end-entity certificates in the BTS
- **Skills**
  - Security architecture for embedded devices, applied cryptography, Public Key Infrastructure, Platform Security, Transport Layer Security, Android Security, Trusted Execution Environment, Secure Programming, Secured Onboard Communication.
  - Automotive Network Architecture, CAN, SOME/IP, Vehicle Power Management, IP Transport, L2/L3 Switching
  - Creating technical proposals detailing solutions to customer requirements and effectively presenting them.
  - Architecting software for hypervisor-based virtualization environment.
  - Programming Languages: C, object-oriented Python
  - Tools: Jira, Github, Enterprise Architect
  - Operation Systems: Linux, QNX
  - Standards: X.509, IKEv2, IPsec, TLSv2, SHE, TrustZone
  - Excellent verbal and oral communication skills

### **Leadership Experience:**

- Experience in leading technical task force across multiple tier-1 suppliers and OEM teams to bring product features to fruition from their concept inception to deployment.
- Extensive experience in technically building and mentoring large teams (largest team size being 45) in the area of IP transport, security and layer 2 switching and routing strategies.
- Deft at providing technical leadership across parallel projects, resolving interface issues across multiple subsystems.

### **Teaching Experience:**

- Aricent Technologies: Organizational trainer for 'Debugging Skills'.
- General Motors: Organizational trainer for 'Security and Applied Cryptography Fundamentals'.

### **Educational Qualifications:**

Bachelor of Information Tech. (1997-2001) Indraprastha College, Delhi University, India.

**Awards and Achievements:**

- Certificate of Merit in National Mathematics Olympiad competition, 1995
- Individual Employee Excellence award, Altran Group, 2008

**Extra-Curricular Achievements:**

- 1st Degree Black Belt holder in ITF Tae-kwon-do
- 1 Gold and 1 Silver in South Asian Tae-kwon-do Championships ( ITF), Dec 2008
- 2 Gold and 1 Silver in National Tae-kwon-do Championships, Dec 2006
- Completed Airtel Delhi Half Marathon ' 09 and '10

I hereby agree that the above information is true to the best of my knowledge and belief.

Ritu Pande