

	PUNEET GUPTA 19+ years' exp in Designing Systems and Software Application for Web, Embedded, IoT, Industrial Gateway Looking for Following Roles - Solution Architect Technical Lead - Engineering Manager Techno Managerial Roles	+91 9650870724   puneetg@hotmail.com
B. Tech in Electrical Engineering	Kurukshetra University	2001-2005
MBA in Software Specialization	ICFAI University	2016-2019
Professional Certification in Artificial Intelligence and Machine Learning (Gen-AI) - AIML	IIT, Delhi	2026 Batch (JAN – SEP)

- Embedded Firmware Development on Multiple platforms (**WinCE / Embed Linux/ ARM Microcontrollers**) for **Embedded / IoT / Web based Communication Gateways**.
- **Scrum/Agile** for Software development / Project execution / Product development **Rapid Prototyping -> Proof of Concept -> Iterations -> Code Reviews -> System Integration -> Deployment.**
- Worked with global teams in **Sweden, France, Germany, Japan, Thailand**

Technical Skills

Skill Name	Competencies / Areas explored
Embedded C & IoT	• ARM - STM32, Bare Metal (Arduino), ATmega16 Micro controller • ESP32, Raspberry Pi used for IoT, MQTT, and AI-ML • Serial / Ethernet over SPI interface - RFID, GSM Module interfacing
Industrial Automation	• PLC and SCADA based Data Acquisition & Control Tele-Control and Remote Monitoring over Web HMI • MODBUS (TCP/ RTU), OPC (UA/DA) and IEC-61850 Protocol
C++, VC++ (MFC), Qt	• Win32 API, Multi-Threading, Inter Process Communication (IPC) • TCP, HTTP, Socket programming • Array, List, Vectors, Strings
Visual Studio C#.net Windows and Web	• WPF-XAML based GUI designing for HMI and Simulating Software • SOAP, REST Web Services and XML Parsing, SQL Server • ASP.NET Core, MSSQL, Scripting, WebAPI
Linux platform solutions using Python, C++	• Embedded Linux platforms (Raspberry Pi) and Debian Linux • Hosting Web Apps on Embedded Devices using PHP MySQL, jQuery

Domain Exposure

C++, C#.NET Programming  Networking: • TCP Sockets • IPC (Named Pipes) • Multithreading Standard Library: • List, Vector, Strings, STL APIs & Libraries: • REST API, SOAP • .NET APIs • Database (MS-SQL)	Embedded Systems & IoT (Internet of Things)  Embedded Boards / Micro Controllers : • ESP32, Arduino • STM32 , ATmega • Raspberry Pi (C, Python) Interfacing: • Sensors, MQTT, Cloud Connectivity: • RFID , Telecom & Wireless	AI/ML Artificial Intelligence & Machine Learning  Python • AI/ML, Data Analysis • Predictive Analytics • Colab, Co-Pilot Generative AI Uses deep learning models Agentic AI Autonomous systems designed to achieve complex goals with limited human supervision	GUI , HMI Development  UI Design & Development: • Windows - C#.NET, • Linux – QT Simulation GUI Design: • Protocol Simulator • Driver Dashboard Industrial Automation: • Automation & Controls over HTTP, Web HMI
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Work Experience

	ALSTOM Rail Transport” - Sep 2023 onwards Alstom delivers complete systems - from future-ready trains to Advanced Signaling Solutions for global markets covering India, South Asia, Europe, Canada
Role	Solution Architect As part of Design Team Solution Architect of ATS system (<u>Automatic Train Supervision</u>) working on multiple interfaces for Customer side ▪ Designing Software Interfaces having Communication over OPC-UA protocol to SCADA Vendor ▪ Wash plant SCADA – Automatic Washing of Trains as per Time-Table in UTO Mode (Driverless) ▪ M&E SCADA – Early alert of Earthquake, Flood alarms, events (A&E) and warning XAML based Modern UI- HMI design having SaaS and SQL Server backend ▪ My Role involves • Technical Ownership of CRs (ClearQuest), New Features and Configuration Management (GitLab) • Preparing Software Architecture Document (Sy-SwAD), Configuration Document (SyAD Conf) serving as input and technical write-up for all teams and stakeholders (SW, HW), Integration Team, V&V Team)
Projects	<u>Customer Project</u> Mumbai Metro Project (MML3) for U400 - CBTC based Solution is in Revenue now and the Project specific new features implemented are now extended to other Projects <u>Innovation Project</u> - Created GUI tool that can Interface with Co-Pilot and other Automation APIs / Engineering Tools to generate configuration for Production Environment making Deployment and CI /CD seamless
	QUEST Global – FEB 2023 to SEP 2023 QUEST offers embedded and digital engineering services in Rail / Automotive / IoT
Role	Technical Architect
Projects	<u>BHP Australia Project</u> As part of Global System Engineering Team , was looking into Requirement Specification and Technical Analysis for Rail Project for Mining giant BHP Australia. <u>Innovation Project</u> Worked on integration for AI based IoT Project including Industrial Data Acquisition and Building Automation. This is a Raspberry Pi based Embedded Solution, on while Python Application and library along with MQTT interface to publish data to cloud / my-sql database.
	"GE Vernova” GRID Solutions – DEC 2019 to FEB 2023 GE Grid services diverse industries – from power generation through to data centers – by providing robust Grid infrastructure
Role	Technical Lead
Projects	▪ Worked on GE Grid Solutions - DS Agile IEC61850 based Digital Substation solution for Protection & Control including Communication Gateway software development ▪ As part of R&D - Provided solutions and software fix for issues reported on JIRA by Customer Support / Site Engineer ▪ Mentor and Guide to new Team members and grooming them technically - Thermal Power Projects in India & Europe - Solar and Wind based Renewable Energy Projects Distribution Grid

	"BOMBARDIER Rail Transportation India" - May 2016 to Dec 2019 Global Player in Railway Signaling projects on ETCS (European Train Control System) and CBTC (Communication Based Train Control)
Role	<u>Technical Lead</u> - In ATO Team (Automatic Train Operation) handled standardization of Best Practices / Offshore Process and Workflow of the team for Software Development / Code Delivery to counterparts in Germany / US for Onboard Projects of Bombardier - As Software Architect, delivered technical solutions in Embedded C, C++ using BOOST Library for State Machine based Task Scheduler / Execution GIT for configuration management and Gerrit for code-review RTC (Rational Team Concert) for iteration-based defect tracking & task planning <u>System Integration Engineer</u> - HMI Designing of Driver Console - Embedded Linux platform using C++, QT
Projects	Cross Rail, UK Mainline – City Flow 350, ETCS Level 2, SIL4 BHP, Australia – City Flow 650, ETCS Level2, SIL4 DELHI Metro – City Flow 350, ETCS Level 2, SIL4 CITYFLO 650 is the Driverless Mass Transit solution based on CBTC (Communication Based Train Control) Railway Signaling providing ATO and ATC

	"Alstom India Ltd" – Alstom Power – Apr 2012 to May 2016 Alstom Power has been a global leader in Power generation, focusing on clean power technology, efficiency upgrades, and expanding its renewables portfolio
Role	<u>Lead Software Developer</u>
Project	Web HMI for DCS Systems of Thermal Power Projects undertaken by Alstom - <u>Developed Web interface in Classic ASP for HTTP / Socket connections to the CSS-F controller running on Windows Embedded hosted on ALSPA (Alstom's DCS).</u> - Developed a Web HMI in Classic ASP and AJAX to provide a Web based Human Machine Interface (HMI). This Web-HMI for Remote Monitoring, Diagnostics and Control. The field data is captured by ALSPA Field Controller and interacts with HOST controller (CSS-F) to take the data to the WEB/ CLOUD - Developed a DLL in VC++ for Interposes Communication among Processes - precisely named pipe server and client implementation. This library is used by other processes to fetch data from CSSF and send it to WEB.
Project	To deliver solution for ALSPA HMI- ALSPA HMI Communication to support data exchange across different units of a power plant. ALSPA HMI- ALSPA HMI Communication [C++, APIs, InnoSetup] - Developed Application in C++ to read ASIG, BSIG, MSIG, CMD and SPT signals information and to generate consolidated signals information for the CSSF on both the unit ends. Typically, >80,000 signals were imported in 4 min with < 5% CPU. - Delivered InnoSetup application for configuring and setting up the environment for Gateway on both units ends.
Project	Implementation of new Work packages and Industrial protocols to support communication of CSS-F with 3 rd party devices - At ALSTOM, as part of Gateway Development Team, Implemented Software Solutions to support IEC101-104, OPC protocols for ALSPA Gateway - Deployed customized Windows 7 Embedded / CE images to target hardware & developed Multi-Threaded Win32 applications supporting database interaction (SQLITE), networking protocols (TCP, FTP) for Industrial connectivity. - Fixing of CRs and delivering evolutions for products on ALSPA platform

	Stryker Corporation – Sep 2011 Stryker is a known in Medical & Surgical industry for their devices used by Doctors in Robotic Surgery
Role	<u>Senior Software Engineer</u> Understanding the Client Requirements and following Software Development Lifecycle (SDLC)
Project	<u>Universal Test System (UTS)</u>
	A reconfigurable GUI was prepared in C#.NET and the user could configure it as per its parameters defined in XML. An operation on these XML elements is performed using LINQ for Testing of Stryker Medical Devices
Technologies	C#.NET, XML, LINQ
Project	<u>Real time Platform (RTP)</u>
	A POSIX Application for Sending TCP and Serial Messages was written. In order to test a Device, UTS prepares a Message Format and sends it over Ethernet to the RTP, which then analysis the packet and routes it to the Unit under test (UUT).
Technologies	C++ Linux, Serial and Ethernet Interfacing

	Secure Meters Ltd, Udaipur - Jan 2009 Secure Meters is India's Pioneer Energy Metering company with global business in UK, Australia and focus on Energy Metering Systems and Solutions. It is a CMMI Level 3 certified Product Development company with strong R&D
Role	<u>Embedded Firmware Developer</u> - Developed firmware on STM32F101/07 microcontroller for developing MODBUS TCP and RTU protocol converter for Multiline Panel meter display. - SPI communication to E-Meter and other sub-systems by acting as a Communication Gateway through various Interface – Serial, Ethernet, RS485 - Evaluated LwIP freeware TCP stack and STM32F107 development board for extending ethernet based embedded solutions
Project	Development of Modbus TCP Gateway for Multiline Display panel meter.
	The Modbus Serial Server acts as an interface between Modbus serial devices and computer hosts running Modbus/TCP on Ethernet networks. Modbus TCP protocol is used to communicate to the network devices with statically or dynamically (DHCP) allocated IP address, for Remote data reading and device control through HTTP and TCP over Ethernet network
Technologies	Embedded C Programming STM32F107 Microcontroller having ETHERNET support
Project	Development of Firmware for Energy and Gas Meter for AMI Projects (Home Automation Applications) for Indian and UK market
	Developing firmware on AVR microcontroller for battery powered Gas meter. This involved state machine (FSM) based coding for peripheral interface, tamper detection, load survey maintenance, On demand and Scheduled Meter Reading.
	These Gas meters are installed in central gas distribution system in Apartments. It is a part of Dual fuel Home Energy Controller. There is a ZigBee card that is installed in it for local wireless communication to the HUB.
Technologies	Embedded C Programming AT Mega AVR Microcontroller
Project	Development of Application Software for Meter Data Acquisition System (MDAS)
	This Application Software designed for BCS for Remote Meter Reading and Configuration of Electronic Energy Meter and other communication devices perform on demand and Scheduled Reading.
	- Developing GUI - Web Service and Database interface - Report generation
Technologies	Visual C#. NET 2005, Web Services, MS-SQL 2005

	SM Creative Electronics Pvt td, Chandigarh – JUN 2007 – FEB 2008 SMCEL partnered with Nippon signal (Japan) to work on a Electronic Interlocking project for Indian Railways
Role	<u>Software Developer</u>
Project	Development of Application Software for Electronic Interlocking for Indian Railways ▪ Designing of Visual Display Unit (VDU) for Simulation of the Dagmagpur Station-Electronic Interlocking layout based on Visual C++, features include Serial communication support, Data Redundancy check (CRC16) and Real-Time updation of signals as per logic of Electronic Interlocking. ▪ Designing of Maintenance Monitor for visualization of the status of devices and monitoring the incoming payload / messages from the field devices. Prepared User Manual for Maintenance monitor (MM) ▪ The GUI-EI software simulated the functionality of the Control Panel of the Station Master Room. The Station Master (SM) can either use the panel or this Application Software to control train movements. ▪ The GUI-MM software handles messages received from field devices like Train Tracks, Axle Counter and relays that operate them.
Technologies	C++ DLL interface, C#.NET GUI Designing

	Eon Infotech Ltd, Chandigarh – Jun 2006 – Jun 2007 EON provides Embedded and IT solutions to Companies in Defense and Wireless
Role	<u>Software Developer</u>
Project	Simulation Tool for Indian Navy’s Combat Ship ‘Kavach’ Created C#.Net based GUI Software to simulate the functionality of various hardware connected to the Fire Control Panel (FCP) of a Ship. The input parameters (wind speed, direction, true/ relative, Threat Bearing, Range of Target) are provided to the Main Software in embedded Linux QT Application , through serial communication Main GUI designed in QT running over Linux Environment Having Communication over TCP and Serial to over Software Interfaces to other Simulation Software designed in C#.net
Technologies	QT and C#.net GUI having Serial Communication
Project	“PCB Testing and Calibration Software” Developed VC++ based MFC application for visualizing test performed on the PCB using National Instruments DAQ cards plugged in the PCI slot ▪ API used for Interaction with the DAQ hardware ▪ Export/Create dump of the database ▪ Deployment of the designed Application Software ▪ HTML Help for the end user is created using HTML Help Workshop
Description	This software involves testing of Application Specific PCBs using National Instruments’ serial communication library (APIs and DLLs) with Data Acquisition cards attached to PCI slot. The data acquisition module writes to the oracle database and generates report using Crystal Reports 8.0 software API.
Technologies	VC++ MFC, Oracle database