

**Anand Raju Maji**  
**Scientific Researcher/Data Analytics/ Telecom/Embedded/Firmware/**  
**AI, ML, Java, C, C++, C#, AWS, Python, Pick Basic, Graph and Ontology databases**  
**PM/PrgM/Architect/Lead Developer**

**max@bedatatech.com**

**847-960-5314**

### **Profile Summary**

Accomplished, versatile, goal-oriented IT professional, having over **20+** years of rich and insightful continuous hands-on experience in the architecture, design, development in Cloud, algorithm development, AI and machine learning algorithms and modifying them as per the business requirements, data analytics in release management(RM) , testing in POC, Microsoft's Team App development, in Traffic Safety domain, Telecom domain applications in Verizon, SWIFT's Financial application development, video android phones, Research activities in health care, Embedded firmware & Signal/Image Processing, Audio & Video codecs/Multimedia framework (Android) domain, gaining extensive expertise in Product Development Cycle, Software Development Life Cycle, Project Lifecycle Management as well as Team Development & Management. In addition to IT, have experience in hardware (Electronic circuit design).

- ❖ Development of algorithms or models (mathematical) to suit the business requirements.
- ❖ AI and machine learning algorithms.
- ❖ Having a good Experience with scalable data engineering frameworks such as Apache Spark and orchestration frameworks such as Airflow, and/or experience with semantic search.
- ❖ Having a good experience with Natural Language Processing (NLP), Generative AI and Large Language Models (LLM)
- ❖ Having a good experience in developing analytic driven solutions to business issues.
- ❖ Data Analytics in Release Management And Release Hound (RH) RM App development
- ❖ POC development using cloud technology (AWS).
- ❖ Having a good Knowledge of TensorFlow, PyTorch, Pandas, scikit-learn, NLTK, Azure ML (optional), Amazon Web Services EC2.
- ❖ Microsoft's Team's video codec H.264 tool MLVEC development.
- ❖ Migration from all C/C++ based applications including Informix DB on HP Unix server to C/C++ based PostgreSQL DB Linux CentOS server.
- ❖ Traffic safety software development in Brekford Traffic safety Inc.
- ❖ Telecom software development in Verizon.
- ❖ SWIFT's financial related application development and it's maintenance.
- ❖ Ability to modify code and fix bugs of Cisco's third generation video phones
- ❖ Analytical research and presentation of scientific report ability.
- ❖ Research and prototype design of Medical data Datalogger and its implementation in the architecture of Integrated Clinical Environment (ICE) from ASTM F2761-09 standard.
- ❖ **Special Competence** in Technical Knowledge of embedded firmware/software, RTOS; Strong Aptitude in Requirement Analysis of Market/Client to Product Design; Development of various Video Codecs (MPEG4, MJPEG, H.264/AVC) & Audio Codes (Mp3, AAC, AAC Plus) with file containers (MPEG2 TS, MPEG4, AVI); IPTV; Live streaming; All phases of PDC/SDLC
- ❖ Vast experience in firmware development.
- ❖ Linux device driver and debugging experience on Intel platform
- ❖ Expertise in **Product Development Cycle** involving Requirement Capture, Specification, Concept Design & Documentation, Prototype Development & Analysis, Development Management, Prototyping, Testing, Integration, Product Delivery and Service Support
- ❖ Similar competence in all phases of **Software Development Life Cycle** including Analysis & Study of Business Requirements, Technical & Functional Specifications, Data/Interface/Process Design, Module/Interface Development, Testing, Integration, Implementation along with Service Support

- ❖ Adept in **Team Development** skills like tasking, delegation, monitoring, feedback, skill upgrade, competence management, leading the project, motivation & mentoring of the team
- ❖ Cohesive **Team Player** with Fast Learning Curve along with strong analytical, problem solving, innovation, planning, organizational, communication & interpersonal skills

#### ❖ Published Research Papers

##### ○ Research Papers :

- **A Real-Time H.264 High4:4:4 Codec** published in the Proceedings of the SPIE Aug 2009 (International)
- **Tansen: A query by humming based music retrieval system** published in the Proceedings of National Conference on Communication, IIT/IISc India Feb 2003
- **Building A Melody Retrieval System** published in the Proceeding of National Conference on Communication, IIT/IISc India Feb 2002)

#### Key Strengths

- ❖ Scientific Research capabilities
- ❖ Pick universe programming
- ❖ DSP & Image Processing Algorithm development
- ❖ Digital Video Codec development
- ❖ Direct show Multimedia Framework
- ❖ Stage fright Multimedia Framework
- ❖ AI Algorithm development
- ❖ SWIFT's FIN development Processes
- ❖ Embedded Systems & Digital Image Processing
- ❖ Problem Analysis, Architecting & Prototyping
- ❖ Team Development & Leadership
- ❖ Video algorithm development
- ❖ Audio codec development and its application

#### Education

- ❖ **Ph D (Query By Humming - QBH)**, from Indian Institute of Technology, Bombay, India (Dec2003)  
(After one year Discontinued)  
**Distinction (CGPA of 8.88/10) COURSE WORK**
- ❖ **M. Tech. (Communication Engg)**, from Indian Institute of Technology, Bombay, India with **Distinction (CGPA of 8.27/10)**
- ❖ **B. E. (Electronics and Communication)**, from University College of Engineering, Osmania University, Hyderabad, India

#### Technical Skills

<b>Embedded Platforms:</b>	ARM,QNX,INTEL-Xscale PXA250, PXA255, Bulverde PXA 27X Microprocessors and Intel 8051 microcontroller
<b>Operating Systems:</b>	Unix-HP, Linux (Redhat,Ubuntu,Embedded (Pocket PC, Mobile2005), Windows, Linux, Pocket PC 2003/2005, Android (Jelly Bean, KitKat)
<b>RTOs:</b>	Win CE, Android, Linux, RDK
<b>Languages:</b>	C, C++,MFC, Matlab, Java, C#, Python, NumPy, Pandas, SciKit-learn, PyTorch GO Lang(Knowledge)
<b>Assembly Languages:</b>	ARM, Intel's Xscale PXA 25x/26x, Intel's Bulverde's WMMX PXA 27X, Intel's MMX SSE2,SSE3,SSSE3,SSE4.1 and SSE4.2
<b>Scripting Tool:</b>	Perl, Linux/Unix Shell Scripts, install scripts using InstallShield
<b>Cloud</b>	Docker, Kubernetes, AWS, SnowFlakes
<b>Data Science</b>	Artificial Intelligence, Machine Learning, Deep Learning, Hadoop, DataBricks

<b>Database</b>	MySQL, Oracle, , PostgreSQL, Informix
<b>CI Tools</b>	Jenkins, GITLab
<b>Other Tools:</b>	SQL Developer, Swift's Eventlook, MS Visual Studio, MS WinCE, Eclipse, Virtual machine, OpenGL, Android Studio, VNC Server and Viewer, ADB Tools, Traceview, Systemview, Embedded frameworks, DLMS server/metering, Debuggers, Compilers, JTAG,I2c,CAN(protocol)
<b>Version control:</b>	Clear case, GIT, Perforce, SVN,
<b>Research</b>	Papers Published in National and International Conferences
<b>Programming</b>	Perm, Python, C++/C, Assembly of ARM and Intel's SSE2 to SSE4.2, DDL and RPC, Unix/Linux Scripting
<b>Release Management</b>	Data Analytics of newly release firmware of RDK video devices
<b>Knowledge on</b>	Internet of Things (IoT), SetTopBox (STB), MPEG2 streaming HTTP Streaming, Java scripts, AVI file format(hands on experience), Symbian OS(mobile phone), WMV and MWV (Microsoft's windows media)
<b>Hardware (Hands on)</b>	Electronic sensors, Customized electronic Circuit design, Oscilloscope, Multimeters(Analog &Digital),

### Training

- Trained on ARM assembly coding
- Hadoop
- Python, NumPy, Pandas, SciKit-learn, PyTorch
- Cloud Skills – Docker, Kubernetes, AWS
- Artificial Intelligence, Machine Learning, Deep Learning
- Graph and Ontology databases in progress for certification

### Project Summary

Researched/Participated/Led/Technical Managed/Architected **multiple Projects** involving Digital Media Processing (Image Processing, Audio, Video, Multimedia Framework – Android and Microsoft's Directshow) & Embedded Systems and the following projects are a snap shot of experience

#### BeDataTech, Atlanta, Georgia

Feb 2025 to Till date

**Solution Architect** & Development

**Area of development is in Data Analytics Tool**

- Data Interpretation and Analysis
- Essential Data Filtering: clean and process large amounts of real-world data.
- User Friendly Interface
- Predictive Modeling
- Retrieving the data from a variety of data sources included DB2, Oracle, SQL Server, Hadoop and flat files.
- Electronic Data Interchange(EDI) Implementation

Environment: Python, EDI, Type script, R language, Operations Research, Data base servers

#### HP, Boise Idaho (Wipro)

Apr 2023 to Jan 2025

**Solution Architect** & Technical Product Management

**Area of development is in HP New model Dune printer firmware**

- Architecting the development of Security layer in the upcoming Dune Printer.
- Point of contact addressing business needs, coordinating development efforts, validating deliverables. Maintain and monitor project sprint plans, project schedules and other related documentation.
- Monitored project implementation and provided technical guidance to development team
- Provided code review of whole team members code to make sure all issues are properly addressed.
- Developed firmware code
- Coordinating project tasks. coordinate tasks among the team members; organize and participate in stakeholder meetings; track and follow-up on important actions and decisions.

- Identifying opportunities for improving business processes.

Environment: Python, C++, Type Script(TS), Printer Simulator, Security protocols, Embedded software

**Comcast Corporation, Philadelphia, Pennsylvania (Wipro) May 2021 to March 2023**

**Architect and Developer**

- **Area of development is in Data analytics in Release Management (RM)**
  - Architecting the development of Release Hound release management app using Artificial Intelligence and machine learning technologies.
  - Using NLP and Generative AI libraries like regular expressions (spacy, langchain), text annotation tools and semantic frameworks.
  - Release Management function with next gen RDK releases for Syndication partners.
  - Impact Analysis of the defect fixes.
  - ML model deployment and operations like DevOps, MLOps, LLMOps.
  - Helping to fix issues reported in Field/QA for multiple platforms.
  - Electronic Data Interchange(EDI) Implementation with timelines planning
  - Deployment and monitoring of release metrics for software releases.
  - Helping the team of Triage of the Field/QA reported bugs.
  - Co-ordination with remote teams.
  - Identify the process gaps and provide alternatives to the data metrics team.
  - Mentoring the team in the release management process and scripts development for Splunk and Elastic searches..

**Environment :** Java, AI, ML, DevOps, Data base servers, EDI, Python, RDK, Data dashboards.

**Microsoft, Redmond, Washington (Wipro) Apr 2020 to May 2021**

**Architect**

**Area of development is in Microsoft's Teams**

- Development of tools to test various hardware devices for Teams application for compliance.
- Development is in the area of video codec H.264
- Tool is to test the capability of hardware video codec H.264 of Microsoft's partner's like Lenova's ThinkSmart office device to fulfil the requirements of Microsoft's Teams App.
- Interacting with Microsoft's partner to help them to sort out their product issues to compliant with Teams app .

**Environment:** Unix server, Linux Ubuntu , C++, Git, orient, H.264 video codecs, Visual studio code, C#, Python and windows command scripts. MAKE, CMAKE and Ninja (build utilities), Android devices

**Brekford Traffic Safety Inc, Hanover , MD Apr 2018 to March 2020  
(Taken over by Rekor Recognition System Inc, Columbia, MD)**

**Sr. Software Tech lead developer**

**Accomplished Responsibilities:**

**Area of development is in Traffic safety**

- Developed RLPR server and client using gRPC (Google Remote Procedure Call) to stream jpeg images.
- Contributed and led the offshore team to develop a system for Moveover law to find traffic violations.
  - It consists of Radar, GPS, three cameras, RLPR(Rekor License Plate Recognition software), Database, User interface, Wifi connectivity components
  - It involves to collect data from devices and their validation.
  - It involves the development of time sync all device components to the host sytem.

- It involves the development of health check of all devices.
- It involves development of Move over violation algorithm and violation package.
- It involves design and development of light weight SQLite database
- Developed C++ code to parse the GPS data and to identify the local address.
- Developed C++ code to parse the Radar data and record the vehicle information.
- Led the offshore team of 4 to develop a system for Moveover law to find traffic violations.

**Area of development is in cloud computing POC solution.**

- POC Development of architecture for processing of VPC flow logs.
- Set up of aws elasticsearch, Kinesis components coupled with ML algorithm.

Environment:

Software: Java, C++11/14, C#, Ubuntu Linux, shell scripting, Identity and Access Management (IAM) domain, GITLab, Eclipse, JSON file, Opencv and FFMPEG libraries, AWS (Lambda, Route53, DynamoDB), SnowFlakes

**Hardware: Radar, GPS, Axes Cameras**

**Verizon, Colorado Springs , Colorado (Hadiamondstar)**  
**2017 to Apr 2018**

**Feb**

**Lead Software developer(contractor)**

**Accomplished Responsibilities:**

**Area of development is in Mediation platform in Telecom**

- This project is to maintain and modernize to latest technologies. This project consists of three applications CDMS (CCS7 Data Management System), ICDMS (International CDMS) and IRTS (International routing & Translations System)
  - Responsible for technical architecture and its design.
  - Monitor production logs for Performance defects and work with respective teams till closure
  - Responsible for incorporating enhancement features that are driven by users of three applications.
  - Responsible for support to users.
  - Work with Infrastructure team, Development team and DBA to understand the Performance environment architecture & design
  - Responsible for Ops and Dev team to deploy builds to production environment
  - Prepare scripts in Performance test environment.
  - Prepare scripts for regular report generation and dispatch to various parties.
  - Prepare scripts to perform regular cront jobs.
  - Maintaining source version control SVN
  - Prepare test results summary report and walkthrough with all stakeholders involved
  - Track all configuration changes done as part of tuning and apply the same in production
  - Monitor production regularly
  - Create heap dump, thread dump and verbose GC analyze understanding documents

**Area of development is in Migration**

- The code deployment from HP Unix server to Linux CentOS
  - C/C++ code to be compiled with new version GNU compilers
  - Informix DB to be replaced by PostgreSQL
  - Make changes in C to make communicate PostgreSQL and recompile

**Area of development is in Mediation platform in Telecom**

- To develop for new mediation systems for following systems
  - Internet Protocol Traffic Systems-VOIP (IPTS)-VOIP: Work involves to develop collection, validation, transformation and distribution in the output format
  - Long Distance Traffic Reporting system
  - Group of Rate Centre (GOR) trunk group resource congestion

Environment: C++11/14, Red Hat Enterprise Linux, Putty, Perl, Shell Scripts, GIT version control, Python, TCP/IP, Corba, Jenkins, Oracle DB, PostgreSQL DB, Informix DB.

SWIFT, Manassas,VA  
to Jan 2017

(HadiaMondstar)

Sep 2015

**Sr. Contractor in FIN development**

**Accomplished Responsibilities:**

- Create Separate OF Recovery set to transfer session feeds from SPDB
- Performance enhancement of Message Extract when data is fetched from remote Oracle DB server
- Add Inter SP Dialog monitoring to SP Manager
- Eliminate duplicate Jrnl reader implementation used by OF and SP
- New Event code generation needed for FCR
- OF Applications should utilize the same compressed TIR and LT methods used by the SP
- Analysis and fixing remarks produced by C++ Unix-hp compiler for SP and RP
- Used Unix shell scripts for testing
- Developing and Debugging code in the Linux (HP unix) environment (gcc, gdb, K Shell, and Perl)

**Environment:** C++, SQL Developer, Exceed, Putty, SWIFT'S EventLook, Clear Case Tools, Unix scripts, Unix(HP)(Linux)

Cisco Systems Inc., RTP NC  
2015

(Hadiamondstar)

Dec 2014 to August

**Sr. Consultant in Android Video Phones**

**Project Title #1:** To investigate to find reasons why Android OS based Cisco's Webex application consumes the maximum CPU computing power.

**Project description:** when Android version changed from Jelly Bean to Kitkat, it was observed that CPU was loaded to 99% of its computing power. Due to this system becomes too slow. Immediate solution was required to provide Cisco's customers.

The solution was found by using trace view and system view and fixed the problem in Linux kernel level.

**Responsibilities:**

- To understand the problem and find the bottlenecks in the code. Specially, in video codec embedded related code.
- Delivery was Immediate.

**Environment:** C++, C, Java(core), Traceview, Systemview, Android studio, Eclipse and ADB tools, Linux (Unix)

**Project Title #2:** To fix bugs of video codec related of Cisco's DX-650, DX-70 and DX-80 third generation video phones based on Android OS

**Project description:** Video codec related bugs were collected through internal use of above Cisco phones. On war foot, all bugs were to be fixed.

**Responsibilities:**

- To understand bug by investigating logs collected and fix the bug.
- Fixed the bug successfully related to bitrate.
- Developed the SSIM Index algorithm to find the distortion quantitatively.
- Fixed ADB issues of the video phones.
- Fixed bugs related to RTP/RTSP using file format MPEG2 TS
- Developed and Debugged code in the Linux (Ubuntu) environment (gcc, gdb, BASH)

**Environment:** C++, C, Eclipse and ADB tools, Virtual machine, VNC server, VNC Viewer, Linux (Unix), Android Embedded, matlab, Android multimedia framework Stagefright engine, OpenMax integration layer standard, UDP, TCP/IP

National Institute of Standards and Technology (NIST)  
U.S. Department of Commerce, Gaithersburg, MD

Sep 2012 to Sep 2014

**Guest Researcher**

**Project Title:** To make a prototype of Datalogger. It is a one of the components of open standard for patient-centric Integrated Clinical Environment (ICE).

**Project description:** The objective of this project is to log medical data of a patient as well as status of medical instrumentation that are connected to patient at various stages (i.e., from Operation theatre to ICU and to general ward) in hospital for real time and forensic analysis. Approximately one million patients are dying yearly in USA in dubious manner. In order to find the cause of the death of a patient this application is useful. Effort here is to make a prototype of above objective with the all available latest technologies. The ICE architecture is from ASTM F2761 standard. Medical related data is supplied by Boston based Centre for Integration of Medicine & Innovative Technology (CIMIT). It is related to MDPnP.

**Responsibilities:**

- Involved in research in the technical knowledge of Flight data recorder (FDR) and presented a scientific report. This effort was to understand any similarity of FDR with ICE Datalogger.
- Contributed in a team for the requirements for medical data Datalogger in the ICE architecture
- Designed UML for datalogger.
- Responsible for design and implementation for MySQL data base to store the medical data in the Datalogger
- Involved in study and use of API's of NIST Data Flow System II (NDFS II). It is a middleware for real time data transporter. Initially data transportation was done with NDFS II.
- Involved in making medical data encapsulated in XML file format and parsing data by deserialization of XML file using C++ objects
- Involved in study and use of RTI DDS (Data Distributed System) API's for data reception from medical devices. It is alternative to NDFS II
- Involved in video sync with the data that is displayed on the monitor and the data that is received from the medical devices
- Successfully prototype has been implemented with fake medical data supplied by CIMIT
- Used shell scripts for auto run on login the machine.
- Research paper is being written.

**Environment:** C++, Multi-threading, MySQL, RTI DDS (Data distribution system for real time data transfer), Shell scripts, VirtualBox, Video codec Libraries, QNX, CentOS, Ubuntu.

**In brief The following technologies worked in India from 2002 to 2012 (on request details will be given) in NVIDIA, Fast Video**

- 64 bit (OS) H264Encoder firmware development
- Video Transcoding firmware development
- H264 Encoder with higher 8bit pixel resolution Firmware development
- Implementation of AAC plus Decoder firmware development.
- Implementation of AAC Encoder and Decoder firmware development.
- Audio video sync (AVS) firmware
- Video encoder and decoder to run simultaneously on SC15 media processor
- Image rotation at an all angles algorithm for firmware development
- Image stitching (Panorama) for firmware development