**Rajesh M**

# PROFESSIONAL SUMMARY

To secure employment with a reputable company, where I can utilize my technical and management skills to be a valuable resource for the company. My area is expertise is implementing machine learning algorithms and data science principles for various applications to guide in future projection and categorization of the data. I have 13 years of experience in Software Development Projects and have led every phase of software life cycle (Requirement’s analysis, Designing, Development and implementation) and Business Process Re-engineering. Experienced in Software Methodologies namely Waterfall Model, Rational Unified Process (RUP), Incremental Model, Rapid Application Development (RAD), and Extreme Programming. Proficient in mobile and web-based applications using different programming and scripting languages. Possess in-depth knowledge in Database design, Stored Procedures and Triggers. Team player with commendable Lead qualities, infectious positive attitude, and strong communication skills. My OPT will start in August and am looking for employer who accepts OPT for the position.

# ACADAMIC SUMMARY

Graduating in fall 2023 in Doctorate Program (Ph.D. in computer science) from Tennessee Tech University. Teaching assistant and Research assistant in Department of Computer Science. Possess in-depth knowledge in Machine Learning, Cyber Security, Cyber Physical Systems (Smart Grid and SCADA) and Network Intrusion Detection methods. Area of research is Network Intrusion Detection using Machine Learning, Cyber Security for Cyber Physical Systems (Smart Grid, SCADA, etc.). Research area includes Network Intrusion Detection, Demand Response and Customer Behavior in Smart Grid.

# EDUCATION

Tennessee Tech University Cookeville, TN

PhD in Computer Science Degree 09/2018 – 12/2022

Western Kentucky University Bowling Green, KY

Degree Master of science in computer science 12/2003

Mepco Schlenk Engineering College Sivakasi, Tamilnadu, India

Bachelor of Engineering, Computer Science 08/1999

# SKILL SET

**Programming Languages**

C, C++, C#, Visual Basic, Visual C++, Java SE 17, ASP.NET 4.5, VB.NET 4.5, ADO.NET, MVC, WCF,

**Scripting Languages**

CSS, HTML, PERL, PHP, XML, Vbscript, JavaScript, JQuery 3.5, Ajax, Bootstrap 5.0, Python 3.8

**Development Tools**

Team Foundation Server 2018, Visual Studio 2019, .Net Framework 4.6, Visual Studio Code 1.65, MATLAB 2020, Microsoft Teams 78.0, OpenDSS-G, Typhoon Hill

**Operating Systems**

Unix, Red Hat Linux, Ubuntu 20.0, Windows Server 2019, Windows 10

**Databases**

IBM DB2, MS Access, Oracle 10, MS SQL Server 2021, SQLite

**Web Servers**

Internet Information Server 10.0, Apache Tomcat 10.0

**Virtual Machine Software**

Virtual Box 6.1, VMWare 7.0

**Document and incident Management**

Rational Requisite Pro 7.1, Rational Clear Quest 9.0, Doxygen 1.0

**Testing Tools**

Mercury Quality center9.0, QTP, NUNIT 2.0

**Reporting Tools**

Crystal Reports X1

**Others**

Software AG designer for Web Methods, SharePoint 2013, XLW (an excel C++ wrapper package),

SAP CRM, GitHub Desktop, Wireshark is 3.6.3.

# WORK EXPERIENCE

## Role: Senior .net MVC Developer

## Water Management System (WMS) [NOV 2016 – Apr 2017] Pennsylvania Department of Environmental Protection (DEP) Harrisburg, PA, USA

This project was developed by IT department of DEP. This system provides state staff to monitor the discharges released by various facilities across Pennsylvania. The facility owners are also provided access to the system to report their daily, weekly, monthly, quarterly and yearly report.

The system generates daily monitoring report daily. This report is then transmitted to Environmental Protection Agency (EPA). Based on the report various actions are taken against the facilities.

**Technical Environment:** Visual Studio 2015, TFS 2015, .NET 4.5, C#, WCF, MVC, XML, Oracle, Bootstrap, JQuery, ClosedXML

## Responsibilities:

* Responsible for design and requirements gathering meetings
* Used TFS 2015 for source control and incident management
* Responsible for creating Oracle tables, Packages and triggers for Download/Upload of excel with Daily Monitoring Report (DMR)
* Responsible for creating Views, Partial Views, Controller and Model for upload/download process of daily report
* Used ClosedXML open source to generate and populate excel spreadsheets for daily report
* Responsible for creating web methods for data manipulation operations and Business layer functionalities
* Responsible for creating helper methods for data type validation and excel functionalities
* Responsible for performance tuning of code and oracle packages
* Performed Unit Testing and Integration Testing of Water Management System
* Responsible for creating test scenarios for User Acceptance Testing

## Role: Track Lead/Senior .net Developer

## Comprehensive Workforce Development System (CWDS) [Nov 2005 - Aug 2016] Pennsylvania Department of Labor and Industry

**Harrisburg, PA, USA**

The project Common Wealth Workforce Development System (CWDS) is being developed and implemented by Deloitte Consulting LLP for Commonwealth of Pennsylvania. It is a web-based application to build an integrated “one-stop" and case management system aimed at supporting Pennsylvania's workforce development needs. CWDS supports the workforce development strategy by creating a more market driven system in administration and finance, targeting and streamlining of funds, and increasing accountability.

**Technical Environment:** .NET 4.5, VB.NET, WCF, ADO.NET, XML, Windows 7, SQL- Server 2014, JQuery, Web methods

**Responsibilities:**

* Responsible for conducting Requirements and Design sessions
* Responsible for Business Process Re-engineering for Financial Management Systems
* Lead design and requirements gathering meetings
* Responsible for development for financial sub systems involving three different agencies
* Responsible for Creating Use cases, sequence diagrams and UML class diagrams
* Involved in the creation of data model for financial sub system
* Responsible for development of Mobile web application for Jobseekers using JQuery
* Responsible for development of WCF web services to interact with Training Providers
* Responsible for development of Web methods-based interface for consuming Job Feed jobs
* Responsible for development of batches associated with consuming Job Feed jobs
* Involved in maintaining interface for SAP Payments for Invoice
* Developed “Save Search and Email Alerts” for Job seeker and employers
* Responsible for knowledge transfer activities with the client
* Responsible for developing stored procedures, views and triggers in sql server
* Involved in the process of performance tuning of stored procedures
* Created reusable User Controls and used them in the user interface
* Involved in development of XML snapshots for history records
* Extensively used Rational Clear quest for incident management
* Involved in creating reports using crystal reports XI for purchase orders
* Performed Unit Testing and Integration Testing of financial sub system
* Responsible for assisting UAT testers in testing of financial sub system
* Lead maintenance items resolution team

## Role: .Net Developer

## Web Pre-certification and Referral for MMO (Medical Mutual of Ohio) [SEP 2005 – NOV 2005]

## Antares Management Solutions

Antares Management Solutions is responsible for the all web based and .net based applications for Medical Mutual of Ohio. The main aim of the project was to convert the already existing application into .net based application. The main users of the system are the doctors and nurses, who are responsible for submitting Reviews for in patients and out patients. This application enables the review process online.

## Technical Environment: ASP.NET, VB.NET, ADO.NET, Windows 2000, SQL-Server 2000, DB2

**Responsibilities:**

* Software Methodology used was RAD (Rapid Application Development)
* Application is developed using ASP.NET and VB.net
* Responsible for creating Data Access layer for the application
* Responsible for individual procedure, diagnosis and provider search pages
* Extensively used ADO.NET for database connectivity and transactions
* Responsible for Session Management between different Review pages
* Created reusable User Controls and used them in the user interface
* Used Third party component (Component one) for Menus and Nested Data Grid
* Performed Unit Testing and Integration Testing of different modules
* Responsible for creating user manual for the application

# ACADEMIC PROJECTS [Aug 2018 – Current]

**Machine Learning**

## Evaluating Intrusion Detection and Correlation of traffic in Controls Systems (Ph.D. Thesis)

Control Systems (Smart Grid, Smart Grid, etc.) includes different OSI layers which uses different protocols for communication. Network Intrusion Detection system is not part of all communication layers. Some work for protocol intrusion detection has been done, no holistic work has been on detection on multi-protocol control system network such as smart grid. No work has been done to determine if attack at a particular network layer affect the rest of the network. Research goals are to Investigate the efficacy of ML algorithms for detecting which attacks for each protocol, which attacks at lower-level protocols cause anomalous traffic pattern in upper layer protocols, which ML algorithms effective in detecting attacks in lower-level protocols and methods to identify correlation between anomalous traffic pattern between layers. Our testbed will include smart meter, raspberry pi which will employ Open Automated Demand Response (OpenADR) for Demand Response.

## Network Intrusion Detection System

This project was to create a network intrusion detection system for SCADA systems that includes power plants, water plants and windmill plants to determine best performing machine learning algorithm. The algorithms included k-means, decision tree, random forest, Support vector machines (SVMs), Feed Forward Network, Voting Classifier and Long short-term memory (LSTM). Datasets were obtained from KDD, NSL-KDD, Mississippi State University (Gas Pipeline), Kaggle (Wind Turbine) and open-source datasets (MODBUS and DNP3 network traffic).

## Malware detection on android applications

The main goal was to explore malware detection in android mobile application. The part of the process was to collect benign and malware datasets for android applications. Androparse tool was used to detect and classify different android application for malware detection. The code was generated using python in Ubuntu 18 environment.

## Drug Re-purposing using machine learning algorithms

Drug repurposing (or repositioning) is a cost-effective approach for finding drugs that can be used to treat diseases for which those medications are not currently prescribed Using drug repurposing, we can identify the most promising drugs for further clinical investigations.

Machine learning techniques were applied for drug repurposing to find existing drugs as an alternate medication for other diseases through drug-drug, drug-genes, drug-enzymes, and drug- targets interactions.

# PUBLICATIONS

* + R. Manicavasagam et al., "Testbed for Evaluating and Analyzing Smart Grid Behavior in Demand Response Scenarios," 2022 14th International Congress on Ultra Modern Telecommunications and Control Systems and Workshops (ICUMT), Valencia, Spain, 2022, pp. 122-127, doi: 10.1109/ICUMT57764.2022.9943371.
  + Rajesh Manicavasagam, Prabin B Lamichhane, Prajjwal Kandel, Douglas A. Talbert. Drug Repurposing for Rare Orphan Diseases Using Machine Learning Techniques. Accepted for 35th International FLAIRS Conference, 2022
  + Mithu, M. R. A., Rogers, M., Ulybyshev, D., Manicavasagam, R., & Asmar Awad, R. (2021). “Feature Classification for Control System Devices”, The International FLAIRS Conference Proceedings, 34.
  + Mithu, M Rayhan Ahmed, Vadim Kholodilo, Rajesh Manicavasagam, Denis Ulybyshev and Michael Rogers,

“Secure Industrial Control System with Intrusion Detection”. 33-rd Intl. FLAIRS conf., AAAI, 2020

# REFERENCES

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