

# Matthew Cameron Humphrey, Ph.D

7 Brannigan Drive, Stafford, VA 22554  
<http://www.mchumphrey.com/resume/resume.html>

Phone: (540) 903-1396  
[matt@mchumphrey.com](mailto:matt@mchumphrey.com)

Team Lead Software Engineer with 15+ years professional experience with special proficiencies in Enterprise Systems, Service Oriented Architectures (SOA) and Graphical User Interfaces (GUI) across the full SDLC of requirements analysis, design, implementation, testing and deployment. Ten years experience creating custom, innovative systems for clients such as General Dynamics, BAE, Veridian, through my own consulting company, plus more as direct hire. Effective and practical Java / OOP skills and knowledge across broad spectrum of web technologies. Proponent and trained scrum master for Agile methods. Published GUI articles, earned awards, and received patent for multi-perspective collaboration.

Languages Java (15+ yrs), XML, XSD, JavaScript, HTML, CSS, XSL, SQL, WSDL, Vue.js, Python  
Systems Windows, Linux (Ubuntu), GlassFish, MySQL, MS SQL Server, JBoss  
Technologies J2EE 6 (13 yrs), EJB 3 (8 yrs), JPA 2, Maven, Ant, JMS (OpenMQ), JSF 2.0, JAX-WS, Web Services, JSon, Swing, RMI, JDBC, JAXB, Hibernate, JProfiler, NetBeans IDE, JBoss, SVN, git, TCP/IP, X.509 security and cryptography

## ADVANCED EDUCATION

PhD in Computer Science (1996)  
University of Waikato, Hamilton, New Zealand  
Thesis “A Graphical Notation for the Design of Information Visualizations”

Master of Science (M.Sc) in Computer Science (1988) with thesis  
“Comparison of an object-oriented programming language to a  
procedural programming language for effectiveness in program maintenance.”  
Virginia Polytechnic Institute and State University, Blacksburg, Virginia

Bachelor of Science (B.S) in Computer Science (1985)  
Virginia Polytechnic Institute and State University, Blacksburg, Virginia

## EMPLOYMENT HISTORY

February 2019—present: Wargaming Solutions Architect for Defense Threat Reduction Agency (DTRA-Fort Belvoir, VA) under Advise and Assist Services contract with Integrity Consulting Engineering & Security Solutions. I assisted in the creation of a wargaming research and development management strategy in order to enhance across the Department of Defense, the creation and operation of wargames with modeling and simulation of nuclear effects. Strategy included community engagement, research and development, software project management, and practical exercise support. Helped assemble an upcoming 5+ year portfolio of projects covering over 30 million dollars.

February 2018—December 2018: Chief Technology Officer for Arctan, Inc guiding multi-project technology advancement to unify and consolidate intellectual property into coherent architectural framework. Designed and supervised significant expansions in software capabilities resulting from streamlined development. Provided hands-on development of Multi-actor Bayesian Value-of-Information Message Processing, including analytical, behavioral, and graphical / user interface layers using Java, JSF, Python3, Vue.js, and other web technologies.

November 2016—December 2017: Senior Software Architect Consultant for Arctan, Inc for DARPA project to support research and development of sophisticated distributed communications and simulation platform. Java and R-script development in distributed TCP / IP environment. Produced critical design documents, interface specifications, implementations. Supported successful win of Phase II contract.

November 2016—October 2017: Senior Software Engineer Consultant for EDAU / DOJ in Quantico, Virginia to support highly technical data acquisition systems. Single-page web app including GUI design and implementation in Vue.js, backend services in Python using Falcon services. Analyzed, designed, and developed powerful Java-based transparent USB scan-and-recover data system for deployment on microdevices. Low-level safe-update system for microdevices on Ubuntu 16+ and VMWare image management. Created significant design documents and technical reports.

September 2013—November 2016: Chief Software Architect and Technical Lead with CSRA for ETMU / DOJ in Quantico, Virginia. Supervise 5 major projects and 8 developers. Lead designer and developer for improved Java / J2EE / JSF / JPA web application to streamline subpoena data retrieval process, plus several important web-service applications involving custom protocols. Enterprise design for new and enhanced applications for legal demand web services and end-user web applications. Created significant design documents, project planning documentation including complex test environments.

February 2010—September 2013: Chief Software Architect and Technical Lead with BAE Systems for ETMU / DOJ in Quantico, Virginia. Developed innovative, mission critical Java / J2EE enterprise systems that decreased investigation research times from 2-3 months to 2-3. Full lifecycle support (from requirements through development to delivery) for a sophisticated suite of eBusiness SOAP web services and user applications totalling around 1MLOC. Established multi-system architectural framework with standardized library, Maven build and deployment configurations to significantly compress application development time, eliminate deployment bugs and increase developer effectiveness. Introduced Agile / Scrum development processes to achieve greater team visibility and efficiency. Received BAE Bronze Award for innovation.

September 2009—February 2010: Senior Software Engineer for Computer Sciences Corporation. Full-lifecycle (analysis through to testing) support to various projects: produced detailed task model & prototype for new Java web application. Quickly productive in new environment, pick up new technologies easily (Maven, WSDL, Tapestry 5, Axis2, WSO2.) Applied Scrum development methodology.

### **CONSULTING PROJECTS PERFORMED THROUGH SELF-OWNED COMPANY IVIZ, LTD.**

February 2008—January 2009: Successfully completed subcontract to BAE for Pro-Active Intelligence (PAINT) project. Designed and developed easy-to-use Java APIs for 3<sup>rd</sup> party contractors to access COMPOEX simulation framework, build and validate simulation model components. Created probe analysis GUI “ProbeSearch” for multithreaded, fault-tolerant simulation of differential hypotheses; included Java Swing clustering visualization of probe characteristics. Visualization tool “Surveyor” enabled highly extensible and configurable visualization of selected probe results including complex diagrammatic visualization with animation and user-selectable time-series graphs. Also servlet / JSP-based report generator for viewing data.

May 2008—November 2008: Successfully completed subcontract to BAE for Human Terrain Analysis project. Extended COMPOEX modeling and simulation framework (see below) with geospatial capabilities including multiple levels of geo-information modeling, geospatial models (with ESRI / ARCGIS extensible framework) and geospatial simulation capabilities. Designed and developed complete JAXB / JAX-WS web service to enable GIS capabilities to be accessed from non-Java clients (C# plug-ins embedded in ArcGIS tools.) Created Java Swing GUI tool “ViewMaker” to allow quick visualization of simulation results.

March 2006—September 2006: Successfully completed subcontract to Cyberneutics for the design and development of their Geo-political Analysis and Modeling Environment (GAME) tool for a Navy SBIR contract. This C# / .NET tool included sophisticated tracking and analysis of multiple hypotheses of possible geopolitical futures. In addition to an archival and version-tracking database with the ability to combine hypotheses from multiple users, the tool required a highly interactive, custom and innovative user interface with novel visualizations of the geographical and influence (support-refute) distribution of the hypotheses.

May 2005—June 2008: Chief architect to BAE for the Integrated Battle Command DARPA modeling and visualization project (COMPOEX). Designed a sophisticated component-based Java architecture for the creation, manipulation and analysis of general-purpose, heterogeneous political-social simulation models. Phase I design

and Java implementation (coordinating 8 BAE subcontractors) successfully won competition against Lockheed-Martin. Phase II augmented the platform with parallel model execution, distributed network service, high-performance data support and web services. The system led to several new contracts.

March 2003—July 2005: Consultant to General Dynamics (Advanced Information Systems) DARPA project HARP. Designed and developed innovative software framework to enable multiple users to collaborate on complex data-modeling objects synchronously and asynchronously without conflict or loss of data. Using this technique, created specialized distributed, networked intelligence analysis tool “M-CIM” based on previous single-user version of the “Critical Intent Model”. Designed and implemented highly interactive, graphical UI and visualizations for this tool. Development in C# / .NET. Awarded patent # 7,895,020.

October 2002—September 2003: Successfully completed subcontract to Veridian project ACTIVE for innovative discrete composable simulations rendered as animated, geospatially-mapped 3D visualizations. Provided architectural and conceptual design skills. Wrote numerous concept and technical papers that helped shape the vision and prototype implementation. Implemented powerful C# / .NET sophisticated simulation engine capable of achieving virtually all of the very ambitious project goals. Design work was instrumental in achieving new project funding. Validate and test simulation engine to ensure correctness. Develop and write-up leading-edge technologies that create significant business value and possible patents.

September 2000—October 2002: Successfully completed subcontract to Revenue Technologies, Inc. Designed new user interface and visual data representations of complex numerical marketing and financial data in order to simplify the overall task model for a revised line of products.

Aug 2001—Nov 2001: Consultant to The Information Union. Provided Java support via custom visualizations of business process diagrams rendered from database data in a commercial web environment. Investigated and documented new web portal applications (e.g. Airline Gate Management white paper.) Supported initial “portalization” of Reserve Airforce Tracking System.

Feb 2001—June 2001: Consultant to ExpLore Reasoning Systems. Investigated and developed multi-format visualization software for matched high (vector) and low resolution dynamic charts to enable client to meet accelerated delivery deadlines. Supported continued development and refinement of XML-based GUI and database-driven GUI screen populator, providing fast turnaround and highly reconfigurable user interfaces. Work fluidly in close integration with existing team.

Aug 2000—Feb 2001: Architectural and UI Design Consultant to Veridian Systems (Genoa, CIM, Athens data mining & Corporate Memory projects). Investigated and designed software architectures for leading-edge analytical research tools. Clarity and completeness of designs enable client technical staff to implement and integrate new functionality much faster, with fewer design changes and with far fewer bugs. Designed user-task models, visualizations and user interfaces that achieve high degree of effectiveness and user acceptance. Developed prototype user interfaces that were so robust they could be directly incorporated in the final system, resulting in enormous time and effort savings.

Sep 2000—Nov 2000: User Interface Consultant to Veridian Systems (JTAT project). Successfully investigated, designed and implemented improved user interface for Markovian analytical modeling tool for predicting weapon system movements. Restructured and fully implemented Java GUI user tasks with novel visualization to significantly ease user input, reduce errors and increase user satisfaction.

## **SELECTED PROFESSIONAL EXPERIENCE -- Complete history available on request**

Dec 1997—Aug 2000: Chief Architect and research software engineer with Pacific-Sierra Research Corp. Designed and implemented Java and CORBA systems for leading-edge DARPA crisis-mitigation system. Produced user interfaces and visualizations for data mining, argument analysis and crisis analysis tools. Architected several systems so as to significantly shorten development time and virtually eliminate integration time while accurately predicting and enabling future functionality. Brought non-users into the system and enabled them to produce

complex analyses in a fraction of the time required. Supervised 6 software engineers in team development and quickly brought new trainees up to speed as team producers.

May 1997–Dec 1997: Consultant with Avenue Technologies Inc. Designed user interface, task model & architecture for large, multi-processor distributed signal generator. Built UI prototypes that clarified the system design, increased the customer's enthusiasm of the product and attracted interest in marketing presentations. Produced a system architecture that enabled unforeseen technical problems to be solved months in advance.

Sept 1988–Mar 1997: Teaching Fellow and permanent appointment of Lecturer (1991) of Computer Science at University of Waikato, New Zealand. Researched, developed and published techniques in graphical user interfaces. Introduced curriculum changes that reduced teaching work loads and increased learning. Increased enrolments over 100% in my courses: Data Structures and Algorithms, Advanced Software Engineering and Human-Computer Interaction. Received outstanding appraisals.

### **SELECTED PUBLICATIONS – Full list available on request**

Humphrey, M.C., "Creating Reusable Visualizations with the Relational Visualization Notation," Proceedings of VIS2000, IEEE Visualization, October 8-13, 2000, Salt Lake City, Utah, IEEE Press, October 2000.

Humphrey, M.C., "A Graphical Notation for the Design of Information Visualisations," International Journal of Human-Computer Studies, Feb 1999.

### **AWARDS AND PATENTS**

2019 Appreciation award from Defense Threat Reduction Agency, Research and Development, Nuclear Technologies Forensics Division for contributions to division strategy.

2012-2015 Various customer citations for outstanding service.

2011 Patent Award 7,895,020 for Multi-Perspective Modeling collaboration technique

2010 BAE Chairman's Award (Bronze) for Legal Demand Services for the DOJ. Web service and user applications for national roll-out with participating partners for the electronic service and return of data for legal demand instruments.

2006 BAE Chairman's Award (Bronze) for COMPOEX Simulation system.