

## Michael A. Jackson

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### **C++ & Java SOFTWARE ENGINEER**

An accomplished Software Engineer with 10 years experience specializing in Object-Oriented Design and Analysis with extensive experience in the full life cycle of the software design process including requirements definitions, prototyping, proof of concept, design, user interface implementation, testing, and maintenance.

- Visualization • GUI Development • Multi-Threaded Programming
- Scientific Data Sets • Object Oriented Development • Image Processing

### **TECHNICAL SKILLS**

<b>Languages:</b>	C++, C, Java, Shell Script
<b>APIs:</b>	VTK, Qt, Boost, STL, HDF5, ParaView, ITK
<b>Methodologies:</b>	Object Oriented Programming, UML, Unit Testing
<b>Operating Systems:</b>	Mac OS X, Linux, Windows
<b>Tools:</b>	Eclipse, CMake, GIT, SSH, Xcode, Visual Studio, GCC Tool set

### **PROFESSIONAL HISTORY**

#### **Independent Software Consultant, Dayton, OH**

**Sept. 2008 - Present**

As a consultant I provide software engineering services to both academic and government agencies.

#### **Principal Software Engineer**

Responsibilities include the design, implementation and deployment of applications that meet each customer's unique requirements. Select past projects are listed below.

**Project:** Software Tools for Multi-Scale Representation of Ni-based Superalloy Microstructure

**Summary:** This project collected various next-generation image processing filters into easy to use Graphical User Interface based applications from the existing command line versions and MATLAB versions. The Qt software framework was used to quickly create cross platform applications for deployment onto the client's computing systems. CMake was used for project management and generation of platform dependent build system while Git was employed for source code management and revision control.

**Project:** Software Tools to Perform Image Processing and Tetrahedral Meshing of Robo-Met.3D™ Data Sets MNML-3 & MNML-5

**Summary:** A collection of applications were developed to aid researchers at the US Air Force Research Laboratory process large numbers of images acquired through the RoboMet.3D instrument. The primary functions of the applications included alignment of individual tiles within each slice, alignment of stitched mosaics, removal of relative rotation of each mosaic, segmentation of images into binary or ternary images and export of fully registered and segmented stacks of images.

**Project:** Software Integration Technologies Developed by D3D Teams and the AFRL

**Summary:** Software projects include the implementation of a "Euclidean Distance Transformation" filter, a "Crystallographic Orientation Coloring" filter and further maturing the MXADatamodel project by providing a ParaView plugin to read and display data stored in an MXA file.

**Project:** MXADatamodel

**Summary:** This projects aim was to create a scientific archival format that was self describing, scalable, fast and cross platform. HDF5 storage file format was used to store vast quantities of scientific data sets in addition to a model of the experiment being stored in the HDF5 file in order to further archive the pedigree of the data.

### **Additional Skill Sets**

- Ability to write code which maintains portability across compilers, 32/64 bit implementations and across operating systems
- CMake based build system to allow for more maintainable cross platform projects
- Use of consistent commenting schemes to facilitate automatic extraction and generation of API documentation
- Graphical User Interfaces designed and implemented using the Qt software toolkit
- Conversion of auto-conf based build system to cross platform CMake based build systems
- Designing filters for the Visualization Toolkit (VTK) software package
- Designing plugins for the ParaView visualization program
- Update open-source packages and provide software patches back to those projects.
- Provides web server and source code repository as client's needs dictate.

### **IMTS, Fairborn, OH**

**2005 – Aug. 2008**

This company provides advanced computing services to Federal Government agencies.

### **Senior Software Engineer (2005 – Aug. 2008)**

Responsibilities included the visualization of large data sets through custom applications and the implementation of a scientific data archival API.

- Part of a 5-person team tasked with writing custom software solutions for the Materials and Manufacturing Directorate at AFRL/WPAFB.
- Designed and Implemented in C++ a library that allows researchers to archive experimental results in a consistent form within an HDF5 file.

- Designed and Implemented in C++ custom plug-ins for the ParaView visualization application which allow the researcher to read custom data files, render the data to screen and perform subsequent filtering on the data.
- Conducted customer interviews to determine software feature sets.
- Created software development plans which include labor hours and dependency analysis.
- As part of the data archival project I also designed and implemented a cross-platform application that allows the researchers to view the archived data including time based data in a “movie” like way.
- Documented source code using the Doxygen tool and generated extra documentation using HTML as needed per project.
- Utilized the Boost unit-testing library to test compiled software for correctness on each platform.
- Utilized CVS for software version control during entire development process.
- Administrator for a small visualization laboratory that includes several 3D active Stereo display screens.
- Used the CMake build system to create a cross platform build system for all projects.
- Part of a team that was awarded the April 2008 cover of “Macromolecules” Journal.

**ISTL, Inc., Beavercreek, OH**

**2001 – 2005**

This company provides scientific data management products and services to government and commercial research and manufacturing customers.

**Senior Software Engineer (2001 – 2005)**

Responsibilities included java-based projects, database development, web site design and development, product testing and quality control.

- Implemented a Java based library that contained a TCP/IP based, multi-threaded communications protocol, a binary file decoder, and reusable user interface components. This library formed the foundation for all other java projects within ISTL.
- Designed, implemented and maintained both the client side and server side of a Java based 2 tier web application server.
- Employed XML, XSLT and the Formatting Objects Protocol (FOP) libraries to allow the end user to export stored data as HTML, PDF or plain text.
- Utilized Object-Relational Mapping tools to model production data into an SQL Database using JDBC and Enterprise Objects.
- Utilized Java and the Java-Mail library to implement a program capable of emailing status reports and logs from the customer’s remote location.
- Designed and Developed Java based automated testing and validation tools to quickly validate new protocols and ensure adherence to existing protocols.
- Constructed the ISTL corporate web site.
- Regularly communicated with the customer during development to gather requirements and gain feedback on the system.
- Performed hardware and software installation at customer’s remote location.

**AVXM, Inc., Kettering, OH**

**1999 – 2001**

This company developed software for the U.S. government to model and visualize dynamic collisions between atomic particles.

**Software Engineer (1999 – 2001)**

Responsibilities included java-based projects, simulation codes, simulation visualization, hardware setup, network setup and web site design.

- Ported existing open source molecular dynamics FORTRAN code to Java.
- Designed and implemented a Graphical User Interface using the Swing and OpenGL APIs to configure, run, display and analyze Molecular Dynamics Simulations.
- Constructed small-scale parallel-computing system (Beowulf Cluster) to prototype Parallel Computer algorithms.

**Pratt & Whitney, East Hartford, CT  
1999****1997 –**

A global supplier and pioneer in the aircraft engine industry.

**Materials Engineer (1997 – 1999)**

Responsibilities included material development, design, organization and documentation of material testing, interacting with suppliers and regular briefings to upper management.

- Developed an automated system using Visual Basic that provided a 60x time increase in the processing and delivery of collected scientific data.
- Developed utility in Visual Basic to convert heat treatment data into Excel Charts for engineer review.
- Integral member of engineering team awarded a U.S. patent for chemical milling process (Patent Num. 6,793,838)
- Served as the main focal point for material related issues for the main gearbox of the F119-PW100 engine including casting development, testing and documentation.
- Responsible for designing and coordinating experiments with subcontractors and performing onsite reviews to insure proper procedures were followed.

***EDUCATION*****Bachelor of Science, Materials Science and Engineering**  
Wright State University, Dayton, Ohio**1997****Associate of Science, Liberal Science**  
Sinclair Community College, Dayton, Ohio**1994**