

# JOSEPH WEZOREK

## OBJECTIVE

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A challenging position in software development

## EDUCATION

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1990–1994      Massachusetts Institute of Technology      Cambridge, MA  
■ B.S., Mathematics with Computer Science.

## EXPERIENCE

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2011-2012      Charles River Labs/SPC      Seattle, WA  
*Senior Software Engineer*

SPC, a fully owned subsidiary of Charles River Labs, developed an analytic application (CAPS) for toxicologic pathology. CAPS partially automated hystopathic diagnosis by processing high resolution slides of tissue samples and detecting features characteristic of defined tissue structures and tissue changes. CAPS was an HPC application written in Matlab with performance-critical sections written in C++. The goal, ultimately, was to move the entire system to C++. My contribution directly involved this goal, transforming the application from an R&D project into a product.

Specifically I did the following:

- Designed, implemented, and optimized algorithms in the domain of image processing and feature detection. Frequently this work would take the form of porting functions developed in Matlab to optimized C++. On other occasions, I developed algorithms from scratch as the need arose.
- Extended proprietary C++ libraries for image processing and computational geometry. These libraries were designed for speed and generality using Intel's Performance Primitives and a type traits-based design.
- Refactored a large portion of the CAPS architecture, adding a framework in which region property extractors were re-ified as objects that declared their inter-dependencies and could be applied to input without the calling code being aware of the extractor dependencies. To support R&D work, this framework allowed for extractor objects to be implemented in Matlab but called seamlessly by the C++ framework.
- Drove general system-level optimization work. Profiled Matlab and C++ code in various ways, e.g. attaching Intel's profiler, Amplifier, to the Matlab IDE and/or writing timing scripts. Proposed high-level initiatives for re-design for optimization. Refactored Matlab code personally where necessary, etc.

*Skills:* modern C++ design; C++11 features; STL; Boost; Intel Amplifier; Intel IPP; Matlab; Matlab's MEX API; OpenCV.

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2009–2011      Self-employed      Seattle, WA  
*Independent Contractor*

Provided consulting services for DynaVox Mayer-Johnson.

- Implemented features in the codebase of the Series5 augmentative communication device providing compatibility with DynaVox's newer C#-based line of products and fixed legacy bugs in the Series5 codebase.
- Implemented a standalone Win32 application for converting between the Series5's file format for user pages and the format used by the C#-based software – basically a converter between an opaque binary format and a compressed XML-based format, and vice-versa. The converter was complicated by the complexity of the user-creatable pages e.g. the XML-to-binary direction involved in part parsing a nontrivial scripting language and generating an equivalent composition of serialized binary objects.

*Skills:* C++; STL; Win32; TinyXML; Boost.Spirit and other Boost libraries; C#; Perl.

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2007–2009      Amazon.com      Seattle, WA  
*Software Development Engineer II*

Worked as part of a four person team on a semi-automated pipeline for generating digital content for the Kindle Ebook reader. The pipeline takes as input scans of pages of books, processes the scans through a series of automated and manual stages to generate Ebooks in a proprietary format.

- Maintained and added features to the software used by human editors to generate and modify the internal format used by automated stages of the pipeline to represent ebook content. (C#)
- Maintained and added features to the application that runs on the Kindle to render the pipeline's output. (C++)
- Added features to the pipeline itself to extend the range of books acceptable for conversion. (predominantly Perl)

*Skills:* C/C++; STL; Boost; Java; C#; Perl; XML; XML Schemas; XML DTDs; image processing algorithms; clustering algorithms.

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2006–2007      JustSystems Evans Research, Inc.      Pittsburgh, PA  
*Senior System Designer*

JSERI is a research firm fully-owned by JustSystems, a large Japanese software company. JSERI primarily develops technology for text analysis and natural language processing but also serves as a general R&D facility for its parent company.

- Served as technical lead on a DARPA-funded project, the SHIELD system, dealing with the generation structured data from an unstructured source corpus of intelligence documents.
- Designed and implemented the back end of the SHIELD system, designed its XML output format, the structure of the patterns used for pattern matching, and implemented the pattern matcher.
- Developed and implemented a technique, “topic projection”, also incorporated into SHIELD.
- Implemented a number of algorithms for another product in the domain of project modeling and optimization.
- Designed and implemented a compiler that takes as input a description of a mixed integer linear optimization problem expressed in a high-level algebraic modeling language and generates the sort of low-level representation (i.e. an objective function and set of linear constraints) required by a typical linear solver.

*Skills:* C/C++; STL; Boost Regex library; Java; Swing; XML; XML Schemas; XML DTDs; linear programming; graph algorithms; Perl.

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1997–2006      DynaVox Systems      Pittsburgh, PA  
*Senior Software Engineer*

DynaVox designs and manufactures the world’s premier product in the field of augmentative communication (AC). A portable AC device functions as the voice of an individual who is unable to communicate verbally due to a physical disability.

- Served as senior software engineer on the team responsible for developing the DynaVox Series 4 and DynaVox Series 5 devices.
- Implemented the high level object framework used in both the DynaVox Series 4 and DynaVox Series 5 devices.
- Implemented the template library used in both devices. (The application originally ran on WinCE for which there was no implementation of STL at the time.)
- Implemented an interpreted fully featured user-level programming language that runs on top of the Series 5 device.
- Implemented nontrivial computational linguistics algorithms for performing morphographemic transformations of source text.
- Ported the DynaVox 3100 software to Windows.

*Skills:* C/C++; STL; Win32 API; MFC; Windows graphic programming with the GDI and DirectX; DirectInput; nontrivial multithreading; interprocess communication.

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1996-1997      Innovative Software Designs      Greensburg, PA  
*Software Engineer*

- Implemented the math engine for a software tool used by reliability engineers. The software analyzed block diagrams representing systems of components and calculated properties of the whole system based on the properties of each component, e.g. it would calculate the mean time to failure of, say, three components arranged serially given the failure distributions of each component.

*Skills:* C/C++; MFC; numeric programming techniques, i.e. numeric integration, etc.

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1995-1996      Kurt J. Lesker Company      Clairton, PA  
*Software Engineer*

- Designed process control software for industrial vacuum systems

#### PUBLICATIONS

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- "Japanese Dominance of the Videogame Industry and the Future of Interactive Media,": *The Japanification of Children's Popular Culture: From Godzilla to Miyazaki*, 2008, pp. 85-106.

#### INTERESTS

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- Produce digital artwork that has appeared in *The Nation*, *The American Prospect* and other magazines.

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