John Ernsthausen

Web Developer. Software Developer.

johnernsthausen.com W
john@johnernsthausen.com E

Objective

Seeking consulting and software development opportunities.

Professional Summary

Curious. Think critically. Plan strategically. Wide range of technical skills. Solve impossible problems. Great ideas. Get it done, can do attitude. Background in web development, software development, computational science engineering, and research software development. Experiences range from software development to research to construction to farming to business to sales.

Technical Skills

- **Software** – Matlab, Photoshop, SPSS, R, Office (Libre, iWork, Microsoft)
- **Languages** – Ruby, HTML, CSS (grid, flex, SASS), Fortran, C++, Java
- **Unit Testing** – Google Test, CppUnit, Test::Unit, MiniTest, JUnit
- **Frameworks** – Rails, Jekyll, Wordpress, JQuery, Apache, Puppet
- **Version Control** – git
- **Automation** – Rake, Make, Ant, Grunt, Gulp, Webpack, Puppet
- **Editor** – VIM
- **Operating Systems** – *nix, Mac, Windows, VMS/VAX
- **Databases** – SQL, TSQL, SQLite, PostgreSQL, DDL
- **Industries** – Web, marketing, chemical modeling, electrical modeling, medical equipment, robotic vision, image processing, drug design
- **Methodologies** – Agile, test driven development (TDD), SEO, data management, Model-View-Controller (MVC), DevOps
- **Mathematics** – Mathematical modelling, numerical linear algebra, numerical nonlinear equations, numerical differential equations, differential-algebraic equations, differential geometry

Professional Experience.

DEVELOPER & OWNER
Smarty Pixels
Pittsburgh, PA
2012-Present

- Exceptional software craftsmanship following test driven development.
- Excellent HTML5 and CSS3 skills.
- Experienced Rails developer, exceptional in the View.
- Use the Git version control system.
- Advocate proven search engine optimization (SEO) methods.
- Responsible for marketing and identifying sales leads.
- Pitch creative work to potential and current clients.
- Create effective content for websites.

John Ernsthausen

johnernsthausen.com W
john@johnernsthausen.com E

Professional Experience (continued)

DATA COORDINATOR & ANALYST
Law & Psychiatry
Western Psychiatric Institute
UPMC
Pittsburgh, PA
2007-2010

- Solely maintained an internal data environment that tracked interviews involving 10,000 variables for completeness, imported interview data into usable datasets, and supported other team members in safe data cleaning.
- Improved data tracking quality control.
- Designed a (software) robot to craw the study repository.
- Solely developed and maintained the interactive study website for sub-setting large datasets.
- Automated complex data coding tasks; significantly improved efficiency.
- Helped author and maintain study documentation.

RESEARCH CONSULTANT
Carnegie Mellon University
AnaLux Inc.
University of Pittsburgh
Pittsburgh, PA
2002-2005

- Solely designed and developed next generation software for the real-time computer control of a spectrometer.
- Designed an intuitive, interactive, user-friendly graphical user interface.
- Implemented business logic for real-time image processing at multiple wavelengths.
- Helped define and implement a domain specific language (DSL) for efficient serial communication with an embedded controller.
- Optimized Camera-Spectrometer communications with empirical studies.
- Developed protocols and analyzed data for initial experiments on the early detection of human melanoma cancer.

RESEARCH CONSULTANT
Chromodynamics
Pittsburgh, PA
2002-2005

- Worked on basic science studies of human articular cartilage (knee joint) and the effect of the highly controversial thermal ablation surgical technique as administered by three commercially available instruments.
- Co-authored publications [B2], [B3], and [B4].
- Helped design and assemble a robotic arm to mimic surgical movement.
- Authored MatLab software to control the speed and position of the robotic arm based on a contact pressure objective while collecting temperature data in a harsh radio-frequency environment.
- Developed and implemented image segmentation algorithms to measure live-to-dead cell ratio.
- Formulated and numerically solved a mathematical model for thermal ablation – a partial differential equation – based on parameters found from study data and compared actual results with model predictions.

John Ernsthausen

Web Developer. Software Developer.

johnernsthausen.com W
john@johnernsthausen.com E

Professional Experience (continued)

RESEARCH CONSULTANT
Carnegie Mellon University
Pittsburgh, PA
1999-2001

- Worked with team members on concept development for a mathematical protein folding model of triple-helix collagen proteins containing over 10,000 amino acid centers.
- Developed a first generation software implementation of the model.
- Patented concept [A1].
- Significantly reduced real convergence time over industry standard molecular dynamics software.

RESEARCH ASSISTANT
University of Pittsburgh
Pittsburgh, PA
1994-1998

- Graduate student researcher for W.C. Rheinboldt and P.J. Rabier.
- Identified mathematical models in the open literature.
- Developed scientific software for the numerical solution of differential algebraic equations advancing the field of differential equations.
- Co-authored publication [B5].

RESEARCH ASSISTANT[**LINK**]
University of Pittsburgh
Pittsburgh, PA
1992-1994

- Graduate student researcher for T.A. Porsching and C.A. Hall.
- Developed theory and software for commercial optical grinding applications.
- Co-authored publication [B6].
- Mathematically modeled the commercially deployed draper machine for optical lens manufacturing.

Certifications and Training

LunaMetrics training course on search engine optimization [**SEO**] [**COPY**] [**CONTENT**]

Education

McMaster University, Hamilton, ON, Canada. Master of Science in Computational Science and Engineering, 2018.
THESIS: Rigorous defect control and the numerical solution of ordinary differential equations [**LINK**]

University of Pittsburgh, Pittsburgh, PA. Doctor of Philosophy in Applied Mathematics (all but dissertation).

University of Pittsburgh, Pittsburgh, PA. Bachelor of Philosophy (honors) in Chemistry and Mathematics, 1992.
Graduated Magna Cum Laude.
THESIS: Approximation methods in the computer numerically controlled fabrication of optical surfaces.

Patents

[A1] "Methods and systems for molecular modeling." US Patent Number 25181,. Isrealowitz M, Cohen A, **Ernsthausen JM**, Campbell P, Ernst L, Farkas DL, GalbraithW. [**LINK**]

John Ernsthausen

Web Developer. Software Developer.

johnernsthausen.com W
john@johnernsthausen.com E

Publications

[B1] "Stepsize selection in the rigorous defect control of Taylor series methods." 368 Journal of Computational and Applied Mathematics, 2020, **Ernsthausen JM** and Nedialkov NS. [**LINK**]

[B2] "Temperature requirements for altering the morphology of osteoarthritic and nonarthritic articular cartilage: in vitro thermal alteration of articular cartilage." 32 no. 3. Am. J. Sports Med., 2004, 688-692. Kaplan LD, Ionescu DS, **Ernsthausen JM**, Fu FH, Bradley JP, and Farkas DL. [**LINK**]

[B3] "The thermal field of radiofrequency probes at chondroplasty settings." 19 no. 6. Arthroscopy, 2003, 632-640. Kaplan LD, **Ernsthausen JM**, Bradley JP, Fu FH, and Farkas DL. [**LINK**]

[B4] "Thermal energy effects on articular cartilage: a multidisciplinary evaluation." 4622. Proceedings of SPIE, 2002, 11-23. Kaplan LD, **Ernsthausen JM**, Ionescu DS, Studer RK, Chu C, Bradley JP, Fu FH, and Farkas DL. [**LINK**]

[B5] "The Hopf bifurcation theorem for quasilinear differential-algebraic equations." 170 no. 3-4. Comput. Methods Appl. Mech. Engrg., 1999, 355-371. Rabier PJ with appendix by **John M. Ernsthausen** entitled, "Calculation of Hopf points in quasi-linear differential-algebraic equations". [**LINK**]

[B6] "A mathematical model of material removal with application to CNC finishing." 18. Mathl. Comput. Modeling, 1993, 25-40. Porsching TA, Hall CA, Bennett TL, and **Ernsthausen JM**. [**LINK**]

Honors and Service

2017 Math Matters, Apply it! Contest [**SIAM**, **UNIVERSITY**]
- Cash award.
- Second place.

2017 CSE Student Symposium presentation contest
- Cash award.
- First place presentation.

1994 M.M. Culver and E. Teplitz Memorial Award, Department of mathematics
- Cash award (only recipient).
- Superior performance in teaching mathematics.

1991 Brackenridge Summer Research Fellowship, University honors college [**LINK**]
- Cash award and summer research fellowship (~40 recipients).
- Academic record, proposed project, and willingness to help create and participate in an interdisciplinary community of students.

1991 Teplitz Scholarship, Department of mathematics
- Cash award and senior year tuition (only recipient).
- Academic record.

1987 to 1992 LaLitta Nash McKaig Scholarship, McKaig foundation
- Tuition.
- Academic record and resident of Somerset County, PA.

1989 The Valspar Corporation Award in Chemistry, Department of chemistry
- Cash award and three month paid summer internship at the Valspar Laboratories in Pittsburgh (2 recipients).
- Academic record.