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Career Objective

Software development for engineering, science, and data visualization applications.

Skills

- Programming in C, C++, Python, C#, Pascal, and Fortran, on Windows and Unix.
- Tools including Subversion, Git, GitHub, profilers, object oriented design, and LaTeX.
- Familiar with Agile methods, pair programming, and test driven development.
- Display of real time 2D and 3D data with OpenGL and MatPlotLib.
- Strong math, physics, and chemistry skills with an engineering background.
- Experience with data acquisition, USB communication, and motion control.

Shipped Products

- RGB seismic data visualization program.
- DistArray distributed array library.
- KinTek Stop Flow and Quench Flow control programs.
- Stop Flow modules for autosampler and spectrometer control.
- Freelancer, published by Microsoft.
- Full Tilt! 2 Pinball and Marble Drop, published by Maxis.

Work Experience

Apr 2012-Jul 2014 Enthought, Austin Texas. Python software developer and consultant.

- Seismic data visualization for oil/gas application.
  This application displayed seismic data as a color image. Wrote code to write geolocated images as GeoTIFF files, located by EPSG code, to interpolate between horizon surfaces in the seismic volume, and for UI components.
- Electron microscope control application.
  This application controlled an electron microscope, acquiring images, video, and x-ray spectra. Elemental composition could be determined from x-ray spectra. The project team was multinational, with contributors in Austin, England, and Netherlands. Wrote code to use image histogram for image level adjustment, to create UI shapes for image sub-selection and calibration, calculation of image profiles, color mixing, data serialization, with numerous tests.
- DistArray distributed array library. http://docs.enthought.com/distarray/
  A distributed array library that is used like NumPy. DistArray is intended to handle very large parallel data and computations. Wrote code to illustrate array distributions with MatPlotLib, coordinate a distributed pseudorandom number generator, and developed examples, including a simulated seismic data volume.
- Enthought Training on Demand.

Reviewed content for Python instructional videos and exercises, contributed new exercises, and suggested animation artwork to explain the technical content well. Improved scripts which published content on Amazon S3 and EC2 instances.

2009-Mar 2012 KinTek Corporation. Software developer for biochemistry instrumentation.

- Developed Stop Flow software to mix liquid samples for chemical kinetics analysis. Software in C++ mechanically mixed liquid samples via servo motor, and optically monitored the reaction. Fluorescence or transmission time history was collected via A/D conversion. Raw data traces could be reduced, edited, averaged, and fitted via nonlinear regression, and were displayed via 2D or 3D OpenGL graphics.
- Developed CTC PAL autosampler control module for automatic sample loading. User specified samples were automatically loaded and analyzed by controlling the sampler robot via serial commands.
- Developed Ocean Optics spectrometer control module for full spectrum analysis. Spectrometer was controlled via WinUsb, and time history was displayed as 3D plots.
- Evaluated instrument performance via test chemical reactions.
- Developed Quench Flow software to mix liquid samples for chemical kinetics analysis. Software used an embedded keypad controller, accepted user desired mixing times, calculated motor push speeds and distances to result in desired reaction times for various instrument geometries, and controlled servo motor via serial communication.
- Developed Python simulation program to analyze test cases.
- Wrote technical documentation in LaTeX to describe calculations.

2007-2008 Laboratory for Molecular and Cellular Dynamics, University of Texas at Austin.

- Consultant for Cels-at-home, a distributed computing project. A large calculation related to cell adhesion was split into independent work units. Volunteers connected to a server, downloaded an application and data, and executed it on their own system. When complete, the results were uploaded to the server, and users were credited for their work.
- Wrote C++ program to perform the main calculations, with OpenGL status display.
- Wrote Python program to process and validate results.
- Setup LAMP (Linux/Apache/MySql/PHP) server using open source framework.
- Setup and managed subversion server for source code control.
- Project resulted in academic publication.

2005-2006 Sabbatical.

1997-2004 Microsoft / Digital Anvil, Austin Texas.

- Shipped Freelancer, a space combat and trading game for Windows.
- Implemented real time playback of character animation cut scenes with audio.
- Developed user interface for game mechanics.
- Maintained and updated game model and animation exporter for 3DS MAX.
- Developed dynamics models and collision physics for a prototype XBox 360 game.
- Wrote audio management tool in C#.NET, integrating into data management system.
- Maintained an automated build system written in C# and ASP.NET.

1996-1997 Maxis, Austin Texas.

- Lead programmer for Full Tilt! 2 Pinball, a game for Windows. Improved previous code base in physics and graphics. Wrote specific game logic for one pinball table, supervising other programmers who wrote logic for two additional tables. Developed installer, and supported internationalization for French and German versions.
- Started development of Marble Drop, a puzzle game for Windows. Programmed a component framework for puzzle components, which was used by other developers to complete the final game.

1994-1996 Origin Systems / Electronic Arts, Austin Texas.

- Development for flight simulator games, including cockpit display, avionics, radar, missile guidance, and flight dynamics simulation.

1992-1993 Medic Computer Systems, Austin Texas.

- Developed an automatic system to process electronic insurance claims.

1990-1991 Department of Mathematics, University of Texas at Austin.

- Wrote programs to solve partial differential equations for reaction-diffusion systems.

1988-1989 Southwest Research Institute, San Antonio Texas.

- Developed programs to analyze engineering structural calculation results.
- Developed driver and user interface for a digitizing tablet.

Education

B.S. in Physics, with Honors, University of Texas at Austin, 1991.

Academic Publications

- Mark Kness, Ge Wang and Muhammad H. Zaman. Journal of Chemical Physics. 130 (23) 235103. 2009. Robustness of Integrin Signaling Network.
- M. Kness, L. Tuckerman, and D. Barkley. Physical Review A, Vol 46, No 8, 15 Oct 1992. Symmetry-breaking bifurcations in one-dimensional excitable media.
- D. Barkley, M. Kness, and L. Tuckerman. Physical Review A, Vol 42, No 4, 15 Aug 1990. Spiral-wave dynamics in a simple model of excitable media: The transition from simple to compound rotation.