Brian R. Keating

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Summary

Computer vision expert with 9 years of experience in image analysis and deep learning applied to medical and satellite imagery. Expert in real-time signal processing for motion tracking with multiple publications validating new technologies. Image analyst in a data science group, comfortable communicating with non-technical colleagues.

Skills

Computer Vision & Image Analysis
Convolutional neural networks for image classification and object detection; image filtering, registration, segmentation; object tracking; camera calibration.

Programming Languages
Python and scientific Python stack (numpy, scipy, sklearn, pandas, skimage); opencv; pytorch for deep learning and convolutional neural networks; working knowledge of bash/Linux; C++, Matlab for MRI work; some Java (Android) for personal projects.

Data Analysis & Machine Learning
Signal processing; Kalman filtering; modeling of biomechanical motion; independent component analysis; conjugate gradient optimization; manipulation, labeling and analysis of large image datasets; classical statistics for clinical data analysis.

Communication
Start-to-finish design, coding, execution, and publication of human studies to validate new motion-correction technologies; multiple academic conference presentations for mixed audiences of engineers and physicians; pitching computer vision solutions to prospective clients.

Education

College of William & Mary, Williamsburg, VA   2007
  Ph.D. in Physics

St. Mary's College of Maryland, St. Mary's City, MD   2003
  B.A. in Physics

Employment & Research Experience

Computer Vision Engineer   2016–present
Uptake, Inc.
• Lead a small Data Science R&D group responsible for building Uptake's capabilities in image analytics.
• Develop object detection and change detection algorithms using both classical image analysis and deep learning for use with remotely sensed imagery.
• Work with engineers to build a reusable and scalable image analysis pipeline in order to accelerate deployment of computer vision models.
• Design, implement, and train convolutional neural networks on GPUs; created and labeled a 30,000-image dataset.

Image Analysis & Data Visualization Consultant   2015–2016

Research Computing Center (RCC), University of Chicago

- Scripted image processing – segmentation, registration, filtering, tracking – for microscopy and MRI research.
- Provided software installation and tech support for users of a 13,000 node cluster.
- Taught "Image Analysis in Python" and "Introduction to RCC" workshops.

Assistant Researcher (Junior Faculty)   2011–2014

Dept. of Medicine, University of Hawaii

- Pioneered novel methods for correction of patient motion during MR image acquisition.
- Implemented real-time motion correction algorithms in C++ for use in clinical studies.
- Received an intramural NIH grant to adapt MRI motion correction technology for use in a neonatal population.
- Supported the lab by scripting data analysis, mentoring new hires, and organizing a journal club.

Magnetic Resonance Research Specialist   2008–2011

Dept. of Medicine, University of Hawaii

- Designed and implemented MR pulse sequences and image reconstruction programs in C++.
- Implemented a brain imaging program for a large, multi-center pediatric study.
- Provided general lab support by scripting fMRI statistical analysis in Matlab, operating the scanner, and recruiting study volunteers.

Research Assistant / Ph.D. Candidate   2004–2007

Dept. of Physics, College of William & Mary

- Programmed fluid and plasma simulations for massively parallel computers using the Lattice Boltzmann Method (LBM).
- Investigated numerical stability and implementation of boundary conditions in LBM simulations of turbulent flow.
- Coded simulations from scratch in MPI-Fortran.

Patent Pending

"Systems, devices, and methods for detecting false movements for motion correction during a medical imaging scan", US patent application 15222811, with Thomas Ernst, Aditya Singh, Maxim Zaitsev, and Michael Herbst.