

Justin Blaber

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EXPERIENCE

Staff Engineer
EE/CS Department at Vanderbilt University

Dec 2015 – Present

I currently work in the medical-image analysis and statistical interpretation (MASI) lab. My primary responsibility is to administer, develop, maintain, and provide support for our lab's imaging informatics platform, XNAT (xnat.vanderbilt.edu/xnat/), which is used broadly throughout the Vanderbilt campus to support acquiring, storing, and applying image processing pipelines to medical images.

- Our XNAT instance contains ~80,000 images sessions with ~90TB of medical imaging data (mostly MRI and CT) and directly interfaces with gateways on the Vanderbilt ACCRE cluster to perform automated image processing pipelines
- I assist in translating image processing pipelines developed by graduate students in the MASI lab and “get them to work” with our XNAT instance and ACCRE cluster. The algorithms range from automated segmentation via atlas registration and U-Nets (tensor flow/keras/pytorch) to preprocessing of diffusion and fMRI data
- Maintain the primary backups which consist of 140TB storage server (FreeNAS) and nightly backup (FreeBSD Jail with cron and rsync)
- Maintain our Docker Hub which contains completely containerized image processing pipelines
- Maintain our lab which has a small cluster (SGE) of compute nodes with GPUs, along with various NAS's.
- Provide training and support to students, staff, and faculty which interface with the MASI lab.

PROFESSIONAL CONSULTING

Health Services Research at Vanderbilt University Medical Center

May 2017 – Present

Currently assisting with automating processing/analysis of ECG data (previously “done by hand” with expensive proprietary software); I've developed open-source routines to read Windaq files into MATLAB, process the data, and then automatically upload results into a REDCap database.

Crane Composites

Jan 2016 – Jan 2017

Provided support in setting up an image processing apparatus (using my open-source software, Ncorr) which was used to calculate the thermal area expansion coefficient of fibre reinforced plastic (FRP) materials. This information was used to help prove their FRP materials had superior heat resistance.

EDUCATION

Georgia Institute of Technology - 2014

Master of Science in Mechanical Engineering (NSF Fellow)

- GPA: 3.70/4.00

University of Florida - 2011

Bachelor of Science in Mechanical Engineering

- GPA: 3.94/4.00

SELECT ENGINEERING PROJECT(S)

Ncorr (ncorr.com)

Open source software I developed in MATLAB/MEX/C++ that uses image processing techniques to compute displacement and strain fields for materials undergoing deformation (also known as “Digital Image Correlation” in the field of solid mechanics).

- As of 2/12/2018, associated publication has **147** citations
- I developed a complete port in C++ using C++11, FFTW, SuiteSparse, and OpenCV libraries

TECHNICAL SKILLS

Languages: MATLAB, Python, Bash, C++

OS: Ubuntu, CENTOS, FreeNAS, and Windows

Other: Docker, Singularity, REST

SELECT PUBLICATIONS

- *Empirical consideration of the effects of acquisition parameters and analysis model on clinically feasible q-ball imaging.* K Schilling, V Nath, **J Blaber**, P Parvathaneni, A Anderson, and B Landman. *Magnetic Resonance Imaging* (2017)
- *Empirical Estimation of Intra-Voxel Structure with Persistent Angular Structure and Q-ball Models of Diffusion-Weighted MRI.* V Nath, K Schilling, P Parvathaneni, A Hainline, **J Blaber**, Z Ding, A Anderson, and B Landman. *Journal of Medical Imaging* (2017)
- *Ncorr: Open-source 2D Digital Image Correlation Matlab Software.* **J Blaber**, B Adair, and A Antoniou. *Experimental Mechanics* (2015)