

Madison G. McGaffin
mcgaffin@umich.edu · hello.greycoll.me

EDUCATION

2010/09	-	2015/05	Ph.D.	Electrical Engineering: Systems	University of Michigan
2010/09	-	2012/05	M.S.	Electrical Engineering: Systems	University of Michigan
2006/08	-	2010/05	B.S.	Electrical Engineering & Mathematics	Tufts University

DISSERTATION

- [1] M. McGaffin. *X-ray CT image reconstruction on highly-parallel architectures*. PhD thesis, Univ. of Michigan, Ann Arbor, MI, 48109-2122, Ann Arbor, MI, 2015.

JOURNAL ARTICLES

- [1] M. McGaffin and J. A. Fessler. Alternating dual updates algorithm for X-ray CT reconstruction on the GPU. *IEEE Trans. Computational Imaging*, 1(3):186–99, September 2015.
- [2] M. McGaffin and J. A. Fessler. Edge-preserving image denoising via group coordinate descent on the GPU. *IEEE Trans. Im. Proc.*, 24(4):1273–81, April 2015.

CONFERENCE, SYMPOSIUM AND PREPRINT PAPERS

- [1] M. G. McGaffin and J. A. Fessler. Multi-node model-based image reconstruction with GPUs. In *SIAM Conf. Imaging Sci., Abstract Book*, 2016. Submitted.
- [2] M. G. McGaffin and J. A. Fessler. Accelerated parallel and distributed iterative coordinate descent (ICD) for X-ray CT. In *Proc. 4th Intl. Mtg. on image formation in X-ray CT*, 2016. Submitted.
- [3] R. Sampson, M. G. McGaffin, T. F. Wenisch, and J. A. Fessler. Investigating multi-threaded SIMD for helical CT reconstruction on a CPU. In *Proc. 4th Intl. Mtg. on image formation in X-ray CT*, 2016. Submitted.
- [4] M. G. McGaffin and J. A. Fessler. Algorithmic design of majorizers for large-scale inverse problems, 2015. arxiv 1508.02958.
- [5] M. G. McGaffin and J. A. Fessler. Fast GPU-driven model-based X-ray CT image reconstruction via alternating dual updates. In *Proc. Intl. Mtg. on Fully 3D Image Recon. in Rad. and Nuc. Med*, pages 312–5, 2015.
- [6] M. G. McGaffin and J. A. Fessler. Fast model-based X-ray CT reconstruction on the GPU. In *UM Grad. Symp.*, 2014.
- [7] M. G. McGaffin and J. A. Fessler. Duality-based projection-domain tomography solver for splitting-based X-ray CT reconstruction. In *Proc. 3rd Intl. Mtg. on image formation in X-ray CT*, pages 359–62, 2014.
- [8] M. G. McGaffin and J. A. Fessler. Fast edge-preserving image denoising via group coordinate descent on the GPU. In *Proc. SPIE 9020 Computational Imaging XII*, page 90200P, 2014.
- [9] M. G. McGaffin and J. A. Fessler. Sparse positive-definite FIR filter design with Schatten p-norm optimality. In *UM Grad. Symp.*, 2013.

- [10] M. McGaffin and J. A. Fessler. Sparse shift-varying FIR preconditioners for fast volume denoising. In *Proc. Intl. Mtg. on Fully 3D Image Recon. in Rad. and Nuc. Med*, pages 284–7, 2013.
- [11] L. Fu, Z. Yu, J-B. Thibault, B. D. Man, M. G. McGaffin, and J. A. Fessler. Space-variant channelized preconditioner design for 3D iterative CT reconstruction. In *Proc. Intl. Mtg. on Fully 3D Image Recon. in Rad. and Nuc. Med*, pages 205–8, 2013.
- [12] M. G. McGaffin, S. Ramani, and J. A. Fessler. Reduced memory augmented Lagrangian algorithm for 3D iterative X-ray CT image reconstruction. In *Proc. SPIE 8313 Medical Imaging 2012: Phys. Med. Im.*, page 831327, 2012.

PATENTS

- [1] F. Lin, M. G. McGaffin, Z. Yu, J-B. Thibault, S. Ramani, J. A. Fessler, B. De Man, and D. Pal. Patent 20140369581: Iterative reconstruction in image formation, December 2014.

TEACHING

ENGR 100-300: Music Signal Processing	Fall 2014
ENGR 100-300: Music Signal Processing	Fall 2012
ENGR 100-300: Music Signal Processing	Fall 2011

INTERNSHIPS

MIT Lincoln Laboratory Signal processing for X-band inverse synthetic aperture radar	2009/09 - 2010/05
MIT Lincoln Laboratory Over-the-horizon radar target simulator embedded system	2009/06 - 2010/08
IBM Rational Engineering Systems Distributed computer monitoring and alert system	2008/06 - 2008/08

COMPUTER SKILLS

- Programming languages: C, C++, Rust, Python, MATLAB, OpenCL
- Domains: GPU programming, distributed computing
- Various: git, L^AT_EX, Unix

PROFESSIONAL AFFILIATIONS

- 2009–Present: IEEE
- 2009–2010: Eta Kappa Nu, Tau Beta Pi

SERVICE

- 2015: Reviewer, IEEE Signal Processing Letters
- 2015: Reviewer, IEEE Transactions on Medical Imaging
- 2015: Reviewer, IEEE Transactions on Image Processing
- 2015: Reviewer, IEEE Transactions on Computational Imaging

AWARDS

Fully3D GPU Award Fully3D Conference	2015
Rackham Travel Grant University of Michigan Rackham Graduate School	2012 – 2015
Fully3D Travel Grant Fully3D Conference	2013
GAANN Fellowship University of Michigan EECS Department	2010
Amos Emerson Dolbear Scholarship Tufts University ECE Department	2010
Watson Scholarship IBM	2006–2010