

## Mark A. Iwen

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EDUCATION **University of Michigan, Ann Arbor**  
Ph.D., Applied and Interdisciplinary Mathematics, expected August 2008

- Dissertation Topic: “Fast Approximation Algorithms”
- Adviser: Martin J. Strauss

**University of Wisconsin, Milwaukee**  
B.S., Computer Science and Mathematics, May, 2002

RESEARCH INTERESTS I am generally interested in algorithmic projects that explore the interplay between computational cost (e.g. runtime) and solution precision. Recently these interests have lead me to work on compressed sensing methods related to signal processing, numerical methods, and medical imaging.

### PUBLICATIONS

FAST APPROXIMATION ALGORITHMS

- Iwen, M.A., C.V. Spencer. *Improved Bounds for a Deterministic SubLinear-Time Sparse Fourier Algorithm*. Submitted.
- Farrell, B., Y. Huang, M. Iwen, T. Wang, L. Zhang, and J. Zheng. *Wavelength Assignment in Optical Network Design*. Submitted.
- Iwen, M.A. *A Deterministic Sub-linear Time Sparse Fourier Algorithm via Non-adaptive Compressed Sensing Methods*. ACM-SIAM Symposium on Discrete Algorithms (SODA), 2008. [SODA '08 acceptance rate: 29.7%]
- Iwen, M.A., A. Gilbert, and M. Strauss. *Empirical Evaluation of a Sub-Linear Time Sparse DFT Algorithm*. Communications in Mathematical Sciences, Vol. 5, No. 4, December, 2007.
- Laska, J., S. Kirolos, Y. Massoud, R. Baraniuk, A. Gilbert, M. Iwen, and M. Strauss. *Random Sampling for Analog-to-Information Conversion of Wideband Signals*. IEEE Dallas Circuits and Systems Workshop (DCAS), 2006.

BIOINFORMATICS

- Iwen, M.A., W. Lang, J. Patel. *Scalable Rule-Based Gene Expression Data Classification*. IEEE International Conference on Data Engineering (ICDE), 2008. [ICDE'08 full paper acceptance rate: 12.1%]

MEDICAL IMAGING

- Iwen, M.A., G.S. Mandair, M.D. Morris, M. Strauss. *Fast Line-Based Imaging of Small Sample Features*. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), 2007. [ICASSP'07 acceptance rate: 46.2%]

AI PLANNING

- Iwen, M., and A.D. Mali. *Distributed Graphplan*. IEEE International Conference on Tools with Artificial Intelligence (ICTAI), 2002. [ICTAI'02 regular paper acceptance rate: 30%]
- Iwen, M., and A.D. Mali. *Dsatz: A Directional SAT Solver for Planning*. IEEE International Conference on Tools with Artificial Intelligence (ICTAI), 2002. [ICTAI'02 regular paper acceptance rate: 30%]
- Iwen, M., and A.D. Mali. *Interaction Graphs for Planning Problem Decomposition*. International Conference on Autonomous Agents & Multi Agent Systems (AAMAS), 2002. [AAMAS'02 acceptance rate: 27%]

- Iwen, M., and A.D. Mali. *Automatic Problem Decomposition for Distributed Planning*. International Conference on Artificial Intelligence (ICAI'02), 2002. [ICAI'02 acceptance rate: 30%]

PUBLICLY  
AVAILABLE CODE

- Ann Arbor Fast Fourier Transform (**AAFFT**) 0.9/0.5. A C++ implementation of the Fourier Algorithm developed in "Improved Time Bounds for Near-Optimal Sparse Fourier Representations" (2003) by Gilbert et al.

WORKSHOP  
PRESENTATIONS

- Sparse Spectral Methods. Numerical Analysis of Multiscale Computations Workshop. Banff, Jan. 28 - Feb. 2, 2007.
- Empirical Evaluation of a Sub-linear Time Approximate DFT Algorithm. Sparse Approximation Workshop. Princeton, Nov. 10 - 12, 2006.
- Integrated Circuit Layout Reconstruction. IMA Mathematical Modeling in Industry IX. Minneapolis, Aug. 1 - 10, 2005.

WORKSHOPS  
ATTENDED

- Approximation and Learning in High Dimensions. Texas A&M University, College Station, Texas, Oct. 19 - 21, 2007.
- SIAM Conference on Non-linear Waves and Coherent Structures. Seattle, Sept. 9 - 12, 2006.
- IMA Combinatorics Workshop. Atlanta, July 12 - Aug. 2, 2003.

TEACHING

**University of Michigan**, Ann Arbor, Michigan

- *Math 216 Introduction to Differential Equations* Fall 2007
- *Math 215 Calculus III* Fall 2005
- *Math 116 Calculus II* Winter 2005, Fall 2006
- *Math 115 Calculus I* Winter 2004
- *Math 105 Algebra* Fall 2003

**University of Wisconsin**, Milwaukee, Wisconsin

- *Math 117 Trigonometry* Spring 2002

PROFESSIONAL  
EXPERIENCE

**Hamilton-Sundstrand Aerospace**, Rockford, IL

- *Applied Research Department* Sept. 1998 - Jan. 1999  
Wrote software for simulating unbalanced loads on aircraft power systems. Assisted in constructing a prototype switch reluctance motor/generator controller.
- *Electrical Systems Software Design* Jan. 1998 - April. 1998, June 1999 - Sept. 1999  
Wrote aircraft system software to test system circuits for faults. Tested software/hardware integration of a prototype generator controller.

REFERENCES

**University of Michigan**, Ann Arbor, MI

- Martin Strauss, Department of Mathematics, E-mail: martinjs@umich.edu, Office Phone: 734-763-3005, Web: <http://www.eecs.umich.edu/~martinjs/>
- Anna Gilbert, Department of Mathematics, E-mail: annacg@umich.edu, Office Phone: 734-763-5728, Web: <http://www.math.lsa.umich.edu/~annacg/>
- Jignesh Patel, Department of EECS, E-mail: jignesh@eecs.umich.edu, Office Phone: 734-647-1806, Web: <http://www.eecs.umich.edu/~jignesh/>
- Karen Rhea, Department of Mathematics, E-mail: krhea@umich.edu, Office Phone: 734-936-9936, Web: <http://www.math.lsa.umich.edu/~krhea/>