Yaniv Plan

1250 Astor Ave, #1913   www.yanivplan.com   Married + 1
Ann Arbor, MI 48104   yplan@umich.edu   US citizen
510-219-6466

Research Interests

Applied probability, high-dimensional inference, mathematical signal processing, geometric functional analysis, random matrix theory, compressed sensing, matrix completion, dimension reduction, and big data analysis.

Education

Ph.D. in Applied and Computational Mathematics   Pasadena, CA
California Institute of Technology   *2005 – 2011*

- Advised by Professor Emmanuel Candès.
- Thesis: "Compressed sensing, sparse approximation, and low-rank matrix estimation."

B.A. in Applied Mathematics *and*
B.A. in Physics   Berkeley, CA
University of California, Berkeley   *2000 – 2004*

- With distinction in general scholarship and honors in Applied Mathematics.

Academic Work Experience

- **NSF Postdoctoral Fellow** *and*
  Hildebrandt Assistant Professor in Mathematics   Ann Arbor, MI
  University of Michigan   *Jun. 2011 – present*

- **Visiting Scholar**   Stanford, CA
  Stanford University   *Aug. 2009 – Feb. 2011*

  - Concurrent with Caltech Ph.D. studies.

- **Research Assistant**   Berkeley, CA
  University of California, Berkeley   *Aug. 2004 – Apr. 2005*

  - Bioinformatics research with Professor Rainer Sachs.

- **Research Assistant**   Berkeley, CA
  University of California, Berkeley   *Aug. 2001 – Dec. 2002*

  - Astrophysics research in Nobel laureate George Smoot's group.

- **Organized Tutoring**   Berkeley, CA
  University of California, Berkeley   *Jan. 2002 – May 2002, Aug. 2002 – Dec. 2002*

  - Tutored physics through the Student Learning Center (SLC).
  - Received training on how to give class lectures.

Journal Publications

1. Y. Plan, R. Vershynin, "Dimension reduction by random hyperplane tessellations." *Discrete and Computational Geometry*, forthcoming. Available at `http://arxiv.org/abs/1111.4452`.

2. A. Ai, A. Lapanowski, Y. Plan, R. Vershynin, "One-bit compressed sensing with non-Gaussian measurements." *Linear Algebra and its Applications*, forthcoming. Available at `http://arxiv.org/abs/1208.6279`.

3. Y. Plan, R. Vershynin, "Robust 1-bit compressed sensing and sparse logistic regression: A convex programming approach." *IEEE Transactions on Information Theory*, vol. 59, no. 1, pp. 482-494, 2013.

4. Y. Plan, R. Vershynin, "One-bit compressed sensing by linear programming." *Communications on Pure and Applied Mathematics*, forthcoming. Available at `http://arxiv.org/abs/1111.4452`.

5. E. J. Candès, Y. Eldar, D. Needell, Y. Plan, "Uniqueness conditions for low-rank matrix recovery." *Applied and Computational Harmonic Analysis*, vol. 33, no. 2, pp. 309-314, 2012.

6. E. J. Candès, Y. Plan, "A probabilistic and RIPless theory of compressed sensing." *IEEE Transaction on Information Theory*, vol. 57, no. 11, pp. 7235-7254, 2011.

7. E. Arias-Castro, E.J. Candès and Y. Plan, "Global testing under sparse alternatives: ANOVA, multiple comparisons and the Higher Criticism." *Annals of Statistics*, vol. 39, no. 5, pp. 2533-2566, 2011.

8. E. J. Candès, Y. Plan, "Tight oracle inequalities for low-rank matrix recovery from a minimal number of random measurements." *IEEE Transaction on Information Theory*, vol. 57, no. 4, pp. 2342-2359, 2011.

9. E. J. Candès, Y. Plan, "Matrix completion with noise." *Proceedings of the IEEE*, vol. 9, no. 6, pp. 925-936, 2010.

10. E. J. Candès, Y. Plan, "Near-ideal model selection by ℓ_1 minimization." *Annals of Statistics*, vol. 37, pp. 2145-2177, 2009.

11. Y. Plan, L. Hlatky, P. Hahnfeldt, R. Sachs, B. Loucas, M. Cornforth, "Full-color painting reveals an excess of radiation-induced dicentrics involving homologous chromosomes." *International journal of radiation biology*, vol. 81, no. 8, pp. 613-620, 2005.

Submitted for Journal Publication

1. M. Davenport, E. van den Berg, Y. Plan, M. Wootters, "1-bit matrix completion." Available at `http://arxiv.org/abs/1209.3672`.

Refereed Conference Publications

1. Y. Plan, "Structured signal recovery from single-bit measurements." In *10th International Conference on Sampling Theory and Applications*, forthcoming.

2. M. Davenport, E. van den Berg, Y. Plan and M. Wootters, "1-bit matrix completion." In *Signal Processing with Adaptive Sparse Representations*, forthcoming.

3. M. Davenport, E. van den Berg, Y. Plan and M. Wootters, "Lower bounds for quantized matrix completion." In *IEEE International Symposium on Information Theory*, forthcoming.

4. E. J. Candès, Y. Plan, "Accurate low-rank matrix recovery from a small number of linear measurements." In *Proceedings of the 47th annual Allerton conference on Communication, control, and computing*, pp. 1223-1230, 2009.

Invited Presentations and Lectures/Tutorials

- "Introduction to compressed sensing." Presented at *Michigan State University, 2 special lectures in Probability and Statistics*, East Lansing, CA, Aug. 2013.

- "Binary matrix completion." Presented at:

    - *Low dimensional structure in high dimensional systems workshop*, Durham, NC, Sep. 2013.
    - *Joint statistical meetings*, Montreal, Canada, Aug. 2013.
    - *10th international conference on sampling theory and application*, Bremen, Germany, July 2013.
    - *Google*, Mountain View, CA, Nov. 2012.
    - *University of California, Davis Applied Mathematics seminar*, Davis, CA, Nov. 2012.
    - *University of California, Berkeley Neyman Statistics seminar*, Berkeley, CA, Nov. 2012.
    - *Vanderbilt Computational Analysis seminar*, Nashville, TN, Oct. 2012.
    - *University of Michigan Statistics student seminar*, Ann Arbor, MI, Sep. 2012.
    - *University of Michigan Analysis/Probability seminar*, Ann Arbor, MI, Oct. 2012.

- "Structured signal recovery from single-bit measurements." Presented at:

    - *Asilomar conference on signals, systems, and computers*, Monterey, CA, Nov. 2012.
    - *Probabilistic techniques and algorithms workshop*, Austin, TX, Apr. 2012.

- "Matrix completion." Presented at *University of Michigan Analysis/Probability seminar*, Ann Arbor, MI, Mar. 2012.

- "1-bit compressed sensing and sparse binomial regression." Presented at:

    - *14th international conference on approximation theory*, San Antonio, TX, Apr. 2013.
    - *University of Michigan Analysis/Probability seminar*, Ann Arbor, MI, Feb. 2012.

- "Compressed sensing and low-rank matrix recovery." Presented at *University of Michigan new postdoc orientation seminar*, Ann Arbor, MI, Aug. 2011.

- "A probabilistic and RIPless theory of compressed sensing." Presented at *MIT imaging and computing seminar*, Boston, MA, Dec. 2010.

- "Tight oracle bounds for low-rank matrix recovery from a minimal number of random measurements." Presented at *BIRS conference on Sparse Random Structures: Analysis and Computation*, Banff, Canada, Jan. 2010.

- "Accurate low-rank matrix recovery from a small number of measurements." Presented at the *47th annual Allerton conference*, Urbana, Illinois, Oct. 2009.

Teaching Experience

- **Instructor** — Ann Arbor, MI
  University of Michigan — *Oct. 2011 – May 2012 and Oct. 2013 – present*

  Math/Stats 425: Introduction to probability. *(F'13)*

  Math 310: Explorations in probability. *(W'12)*
      – Inquiry-based-learning course. (See `www.math.lsa.umich.edu/ibl/index.html`.)

  Math 115: Calculus 1 *(F'11)*

- **Teaching Assistant** — Stanford, CA
  Stanford University — *(S'10)*

  Stats 330: An Introduction to Compressed Sensing

- **Teaching Assistant** — Pasadena, CA
  California Institute of Technology — *Sep. 2005 – May 2009*

  ACM 95abc: Introductory Methods of Applied Mathematics *(F'05, W'06, S'06, F'07, W'08, S'08)*
      – Lectured for discussion groups with up to 30 students once a week.
      – Lectured for the approx. 200 student class when the Professor was away.

  ACM 116: Introduction to Stochastic Processes and Modeling *(F'06, W'09)*
      – Lectured when the Professor was away.

  ACM 216: Markov Chains, Discrete Stochastic Processes and Applications *(W'07, S'09)*

  ACM 118: Methods in Applied Statistics and Data Analysis *(F'08)*

  ACM 217: Advanced Topics in Stochastic Analysis: Stochastic Control *(S'07)*

University Service

- **Big data group** — Ann Arbor, MI
  University of Michigan — *Sep. 2013 – present*

  – Weekly meetings between mathematicians, statisticians, and researchers in other fields to tackle real big data problems.
  – I analyzed the physics department's *Problem Roulette* data, thus giving a way to individualize on-line study problems to students.

- **Analysis/Probability seminar** — Ann Arbor, MI
  University of Michigan — *Aug. 2011 – present*

  – Organized 1-2 seminars per week in Probability and Geometric Functional Analysis.
  – Invited speakers from within the United States and abroad.
  – Gave several talks about my research.

- **Candès group research meetings** — Pasadena, CA and Stanford, CA
  Caltech and Stanford University — *Mar. 2009 – Feb. 2011*

  – Organized weekly group meetings and invited outside speakers from various universities to present and discuss their research with our group.

– Gave several talks about my research.

- **Stanford high-dimensional inference reading group** — Stanford, CA
  Stanford University — *Sep. 2010 – Feb. 2011*

    – Organized weekly meetings to discuss research literature with members of the group.

Mentoring experience

- **Graduate student guidance**
  University of Michigan

    – Joint research with the graduate student Mary Wootters; part of our work lead to submission of the paper, "1-bit matrix completion." *Jun. 2012 – present*
    – Volunteered to help direct new graduate students through the graduate student mentorship program at the University of Michigan. *Sep. 2011 – present*

- **Research Experience for Undergraduates (REU) summer program**
  University of Michigan

    – Co-mentored undergraduates Albert Ai and Alex Lapanowski culminating in publication "One-bit compressed sensing with non-Gaussian measurements." *May 2012 – Jul. 2012*
    – Co-mentored undergraduate Chenrui Gao, creating an Ann Arbor restaurant recommender system. Data collection and analysis using convex programming. *May 2013 – Jul. 2013*

Grants and Academic Honors

- Structured Quartet Research Ensemble (SQuaRE) funded by the American Institute of Mathematics. Joint with Deanna Needell, Richard Baraniuk, Simon Foucart, and Mary Wootters. *Annual meetings starting Nov. 2013*

- NSF Mathematical Sciences Postdoctoral Research Fellowship. *2011 – present*

- Hildebrandt Assistant Professorship in Mathematics. *2011 – present*

- W.P. Carey and Co. Inc. prize in applied and computational mathematics for an outstanding doctoral disseration. *2011*

- Honors in Applied Mathematics at University of California, Berkeley. *2004*

- Distinction in general scholarship at University of California, Berkeley. *2004*

- National Merit Scholarship at University of California, Berkeley. *2000 – 2002*

- Captain Spencer Scholarship. *2000 – 2004*

- Southwestern Bell Corporation Scholarship. *2001 – 2004*

Referee experience and book reviews

- A number of referee reports for each of the following journals.

- – *Annals of Statistics*
- – *IEEE Transactions on Information Theory*
- – *Journal of the American Statistical Association*
- – *Applied and Computational Harmonic Analysis*
- – *Information and Inference: a Journal of the IMA*
- – *Journal of Machine Learning Research*
- – *Linear Algebra and its Applications*
- – *Bernoulli Journal*
- – *IEEE Transactions on Signal Processing*
- – *IEEE Transactions on Image Processing*

- A number of referee reports for each of the following conferences.

  - – *IEEE International Symposium on Information Theory (ISIT 2010)*
  - – *10th international conference on sampling theory and applications (SAMPTA 2013)*
  - – *Signal processing with adaptive sparse signal representation (SPARS 2013)*

- Detailed feedback, as requested by the editors, of the following books and book chapters.

  - – S. Foucart and H. Rauhut, "A mathematical introduction to compressive sensing," Applied and Numerical Harmonic Analysis, *Birkhäuser*, 2013.
  - – M. Davenport, M. Duarte, Y. Eldar, and G. Kutyiniok, "Compressed sensing: theory and applications," in Compressed Sensing: Theory and Applications, *Cambridge University Press*, 2012.

Languages read, spoken, and written

- **English:** Fluent.

- **Spanish:** Semi-fluent.

  - Studied abroad in Madrid, Spain at *Universidad Carlos III de Madrid.*   *Spring, 2003*

- **Hebrew:** Basic knowledge.