

Andre Tkacenko

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Objective

Signal analysis engineer with background in signal processing and digital communications seeking to leverage technical and professional expertise in the fields of data science and machine learning

Education

- **California Institute of Technology** Pasadena, CA
Doctor of Philosophy in Electrical Engineering; GPA: 4.2/4.0 Jun. 2001 – Jun. 2004
 - Advisor: Professor P. P. Vaidyanathan
 - Field of Specialization: Digital signal processing
 - Ph. D. Thesis: Optimization Algorithms for Realizable Signal-Adapted Filter Banks
- **California Institute of Technology** Pasadena, CA
Master of Science in Electrical Engineering; GPA: 4.2/4.0 Sep. 1999 – Jun. 2001
- **California Institute of Technology** Pasadena, CA
Bachelor of Science in Electrical Engineering; GPA: 4.1/4.0 Sep. 1995 – Jun. 1999

Experience

- **Jet Propulsion Laboratory** Pasadena, CA
Signal Analysis Engineer Feb. 2005 – Present
 - Developed algorithms for spectrum reconstruction of non-uniformly sampled interferogram data obtained from the Tropospheric Emission Spectrometer (TES) instrument on-board the Aura (EOS CH-1) satellite
 - Implemented optimal step-size block-based independent component analysis (ICA) and constant modulus algorithm (CMA) methods for underdetermined blind source separation (BSS) of digital telemetry signals
 - Characterized radio frequency interference (RFI) from the upcoming NASA-ISRO Synthetic Aperture Radar (NISAR) on several satellite missions based on orbital and RF parameters; assessed compliance with interference limits set forth by the International Telecommunication Union (ITU) Radiocommunication Sector (ITU-R)
 - Generated comprehensive software model characterizing the Deep Space Optical Communications (DSOC) downlink received signal; channel impairments included blocking effects due to superconducting nanowire single-photon detector (SNSPD), bandwidth limiting due to optical signal amplifier, and offset/drift effects due to receiver clock oscillator instability
- **Department of Electrical Engineering, Caltech** Pasadena, CA
Lecturer Apr. 2012 – Jun. 2012
 - Taught graduate level special topics course entitled EE 150: Applications of Convex Optimization in Signal Processing and Communications, in the spring term of 2012
 - Information for the course can be found at the following URL:
http://www.systems.caltech.edu/dsp/ee150_acospc/
- **Department of Electrical Engineering, Caltech** Pasadena, CA
Lecturer Apr. 2003 – Jun. 2003
 - Taught EE 112b, second term of the graduate level course EE 112: Introduction to Digital Signal Processing, in the spring term of 2003

- Gave lectures, held office hours, and created handouts along with homework sets and solutions

• **Department of Electrical Engineering, Caltech**

Pasadena, CA

Teaching Assistant

Sep. 1998 – Mar. 2003, Sep. 2003 – Mar. 2004

- Graded and prepared solutions for homework sets and held office hours for following courses:

* EE 32: Signals, Systems, and Transforms

* EE 112: Introduction to Digital Signal Processing

* EE 111: Signals, Systems, and Transforms

* EE 160: Communication-System Fundamentals

Computer Skills

Programming/Scripting Languages: MATLAB, Python, C/C++, Assembly (x86)

Operating Systems: Microsoft Windows, macOS, Android, iOS

Software: L^AT_EX, Microsoft Office, Satellite Orbit Analysis Program (SOAP)

Honors & Awards

- Charles H. Wilts Doctoral Thesis Prize (2004)
- Member of Sigma Xi, The Scientific Research Society (1999-present)
- Member (1998-present) and treasurer (1999) of Tau Beta Pi - The Engineering Honor Society, California Beta Chapter
- Valedictorian, Adrian C. Wilcox High School, 1995

Selected Publications

Journal Articles:

1. A. Tkacenko and P. P. Vaidyanathan, “Iterative greedy algorithm for solving the FIR paraunitary approximation problem,” *IEEE Trans. Signal Process.*, vol. 54, no. 1, pp. 146-160, Jan. 2006.
2. A. Tkacenko and B. I. Erkmen, “Parameter Estimation Bounds and Preamble Designs for SOQPSK Waveforms,” *Interplanetary Network Progress Report*, vol. 42-180, pp. 1-30, Feb. 15, 2010.
3. A. Tkacenko, K. J. Quirk, and M. Srinivasan, “Deep-Space Optical Transceiver Uplink Detection Analysis,” *Interplanetary Network Progress Report*, vol. 42-193, pp. 1-40, May 15, 2013.

Conference Proceedings:

1. A. Tkacenko, “Spectral properties and interpolation error analysis for variable sample rate conversion systems,” in *Proc. IEEE Global Communications Conference (GLOBECOM 2007)*, Washington, D.C., USA, Nov. 26-30, 2007, pp. 3123-3127.
2. A. Tkacenko, “Approximate eigenvalue decomposition of para-Hermitian systems through successive FIR paraunitary transformations,” in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2010)*, Dallas, Texas, USA, Mar. 14-19, 2010, pp. 4074-4077.

References

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