

Sancar Adali

Scientist, Raytheon BBN Technologies
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Work Experience

February 2015 - PRESENT

Raytheon BBN Technologies, Cambridge, MA - *Scientist*

- Performer in IARPA FELIX program: Using deep learning methodology to discover evidence of genomic engineering using big data
- Performer in DARPA AIDA program : Using multimodal analytics including video and image analysis to find evidence for multiple competing hypotheses about the data context.
- Automated Low-Level Analysis and Description of Diverse Intelligence Video (ALADDIN) Methodology and software development for event and concept detection in video corpora using deep learning and other common machine learning methods
- Technical solution development under Raytheon-BBN proposals for DARPA and IARPA programs for data analysis and machine learning research such as PROMETHEUS, FELIX, Explainable AI (XAI), AIM

May 2013 - June 2013

XDATA Summer Workshop, Arlington, VA - *Participant*

- Development and application of embedding methodologies and scan statistics for anomaly detection in Bitcoin graphs, graph data analysis of Kiva entity graphs.
- Development of machine learning and data analysis methods to solve diverse set of data science problems

March 2005 - March 2006

Siemens Corporate Research, Princeton, NJ - *Software Eng. Intern*

- Coding & Design for C++ library for CAD based on computational geometry

Published Papers

Donniell E. Fishkind , **Sancar Adali** , Heather G. Patsolic , Lingyao Meng , Vince Lyzinski and Carey E. Priebe (2017). Seeded Graph Matching *Pattern Recognition*, 87, 203–215. <https://doi.org/10.1016/J.PATCOG.2018.09.014>

Sancar Adali, Carey E. Priebe, *Fidelity-Commensurability Tradeoff in Joint Embedding of Disparate Dissimilarities* C.E. Journal of Classification (2016) 33: 485. doi:10.1007/s00357-016-9214-6. <http://rd.springer.com/article/10.1007/s00357-016-9214-6>

Carey E. Priebe, David J. Marchette, Zhiliang Ma, **Sancar Adali**, "Manifold Matching: Joint Optimization of Fidelity and Commensurability", *Brazilian Journal of Probability and Statistics* (2013), no. 3, 377--400. doi:10.1214/12-BJPS188. <http://projecteuclid.org/euclid.bjps/1369746499>

Preprints and Conference Proceedings

Zhoulin Jiang, Viktor Rozgic & **Sancar Adali** . (2017). Learning Spatiotemporal Features for Infrared Action Recognition with 3D Convolutional Neural Networks. PBVS 2017 : 13th IEEE Workshop on Perception Beyond the Visible Spectrum <http://arxiv.org/abs/1705.06709>

Vince Lyzinski, **Sancar Adali** , Joshua Vogelstein, Youngser Park , & Carey Priebe, (2014). Seeded Graph Matching Via Joint Optimization of Fidelity and Commensurability. <http://arxiv.org/abs/1401.3813>

Sancar Adali, Carey Priebe, Optimal Weighting for Joint Optimization of Fidelity and Commensurability in Tests of Matchedness, Joint Statistical Meetings 2011, Section on Statistics in Defense and National Security

Expertise and Research Interests

- Machine learning techniques that are interpretable and provide high accuracy including customized decision trees , deep neural networks with semantic layers.
- Dissimilarity-centric pattern recognition
- Manifold learning methods including manifold alignment techniques
- Optimization and embedding-based solutions to graph matching problem
- Analysis of graph data using random models, dissimilarity representation and embedding methodologies

- Statistical analysis of medical data, prediction of adverse event risks using biomarkers, Survival analysis methods
- Bioinformatics and computational biology applications of machine learning

Education

September 2006 - May 2014

Johns Hopkins University, Baltimore, MD - *PhD in Applied Mathematics and Statistics*

Thesis Title: Joint Optimization of Fidelity and Commensurability for Manifold Alignment and Graph Matching

Investigated Joint Optimization of Fidelity and Commensurability (JOFC) approach to Data Fusion. (specifically Manifold Matching problems). Applied various approaches such as Canonical Correlational Analysis (CCA) to solve the match detection and assignment problem of matched measurements/signals. Applied JOFC to Graph Matching with known correspondences.

September 2003 - February 2005

Brown University, Providence, RI - *M.Sc. in Electrical Sciences and Computer Eng.*

Research Area: Computer Vision and Pattern Recognition

Homography estimation applied to curves in images. Robust estimation algorithms.

September 1999- June 2003

Bogazici University, Istanbul, Turkey - *B.Sc. in Electrical and Electronics Engineering*

Awards

- Graduated with High Honors from Bogazici University (Istanbul, TURKEY)
- Recipient of Acheson J. Duncan award for the Advancement of Research in Statistics from Dept. of Applied Math and Statistics of Johns Hopkins University

Development Experience

- Extensive programming experience in R (5+ years)
- Programming experience in C, C++(3 years), Python, Perl, MATLAB and VXL (a C++ open-source computer vision library)
- Development of R library for customized decision trees (NA-Trees)
- Development of R library for graph matching (RGraphM)
- Experience with common machine learning, visualization and deep learning libraries (scikit-learn, cart, pandas, caffe, keras, tensorflow, ggplot, shiny)
- Development of a Computational Geometry library in C++ using generic programming techniques
- Proficient in various academic and development software tools for document typesetting (Latex), version control (Git, SVN)

References

Available upon request

Languages

English - Fluent

Turkish - Native