Anqi Fu

Curriculum Vitae

Memorial Sloan Kettering Cancer Center
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Academic Employment

2022–Present   **Memorial Sloan Kettering Cancer Center**, New York, NY
Assistant Attending (Faculty), *Department of Medical Physics*.

2021–2022   **Memorial Sloan Kettering Cancer Center**, New York, NY
Postdoctoral Research Scholar, *Department of Medical Physics*.

2016   **Stanford School of Medicine**, Stanford, CA
Life Science Research Professional, *Department of Radiation Oncology (Medical Physics Division)*.

Education

2016–2021   **Ph.D. in Electrical Engineering**, *Stanford University*, Stanford, CA
Dissertation: *Convex Optimization Methods for Adaptive Radiation Therapy*
Adviser: Stephen P. Boyd, Lei Xing.

2012–2014   **M.S. in Statistics**, *Stanford University*, Stanford, CA

2009–2012   **M.A. in Business Research (Economic Analysis and Policy)**, *Stanford Graduate School of Business*, Stanford, CA

2005–2009   **B.S. in Electrical Engineering**, *University of Maryland, College Park*, College Park, MD
Summa cum laude, with the Electrical and Computer Engineering Chair's Award.

2005–2009   **B.A. in Economics with Minor in Mathematics**, *University of Maryland, College Park*, College Park, MD
Summa cum laude, with the Senior Dillard Award for best undergraduate thesis.

Research Interests

- Large-Scale Optimization
- Radiation Treatment Planning
- Machine Learning
- Dynamic Systems and Control
- Computational Oncology
- Statistical Inference

Publications

2024   Z. A. R. Gouw, J. Jeong, A. Rimner, N. Y. Lee, A. Jackson, J-J. Sonke, and J. O. Deasy. "primer shot" fractionation with an early treatment break is theoretically superior to consecutive weekday fractionation schemes for early-stage non-small cell lung cancer. *Radiotherapy and Oncology*, 190(1):110006, January 2024. doi:10.1016/j.radonc.2023.110006.

2023   A. Fu, V. T. Taasti, and M. Zarepisheh. Distributed and scalable optimization for robust proton treatment planning. *Medical Physics*, 50(1):633–642, January 2023. doi:10.1002/mp.15897.

2022   A. Fu, L. Xing, and S. Boyd. Operator splitting for adaptive radiation therapy with nonlinear health constraints. *Optimization Methods and Software*, 37(6):2300–2323, June 2022. doi:10.1080/10556788.2022.2078824.

2021   A. Fu, S. Boyd, L. Xing, B. Narasimhan, and J. Duchi. *Convex Optimization Methods for Adaptive Radiation Therapy*. PhD thesis, Stanford University, June 2021. `http://purl.stanford.edu/yk503fd5318`.

2020   A. Fu, J. Zhang, and S. Boyd. Anderson accelerated Douglas-Rachford splitting. *SIAM Journal on Scientific Computing*, 42(6):A3560–A3583, November 2020. doi:10.1137/19M1290097.

2020   A. Fu, B. Narasimhan, and S. Boyd. CVXR: An R package for disciplined convex optimization. *Journal of Statistical Software*, 94(14):1–34, September 2020. doi:10.18637/jss.v094.i14.

2019   A. Fu, B. Ungun, L. Xing, and S. Boyd. A convex optimization approach to radiation treatment planning with dose constraints. *Optimization and Engineering*, 20(1):277–300, March 2019. doi:10.1007/s11081-018-9409-2.

2009   O.J. Glembocki, R.W. Rendell, D.A. Alexon, S.M. Prokes, A. Fu, and M.A. Mastro. Dielectric-substrate-induced surface-enhanced Raman scattering. *Physical Review B*, 80(8):085416, August 2009. doi:10.1103/PhysRevB.80.085416.

2006   R.D. Shull, V. Provenzano, A.J. Shapiro, A. Fu, M.W. Lufaso, J. Karapetrova, G. Kletetschka, and V. Mikula. The effect of small metal additions (Co, Cu, Ga, Mn, Al, Bi, Sn) on the magnetocaloric properties of the $Gd_5Ge_2Si_2$ alloy. *Journal of Applied Physics*, 99(8):08K908, April 2006. doi:10.1063/1.2173632.

2005   J.L. Her, K. Koyama, K. Watanabe, V. Provenzano, A. Fu, A.J. Shapiro, and R.D. Shull. High-magnetic field x-ray diffraction studies on $Gd_5(Ge_{2-x}Fe_x)Si_2$ ($x = 0.05$ and 0.2). *Materials Transactions*, 46(9):2011–2014, September 2005. doi:10.2320/matertrans.46.2011.

Software

General Optimization

A2DR Python solver implementing Anderson accelerated Douglas-Rachford splitting. `github.com/cvxgrp/a2dr`

CVXR R package for disciplined convex optimization. `cvxr.rbind.io`

Biomedical Applications

AdaRad Python library for adaptive radiation therapy with patient health dynamics. `github.com/anqif/adarad`

ConRad Python library for radiation treatment planning with dose-volume constraints. `github.com/bungun/conrad`

Conference Talks

2022 **AAPM 2022**, *Distributed and Scalable Optimization for Robust Proton Treatment Planning*, Washington, DC

2021 **ECSSC 2021 (Invited Workshop)**, *Convex Optimization for Statistical and Machine Learning with CVXR*, Canberra, Australia

2021 **EURO 2021**, *Anderson Accelerated Douglas-Rachford Splitting*, Athens, Greece

2020 **CIRM Conference on Optimization for Machine Learning**, *Anderson Accelerated Douglas-Rachford Splitting*, Marseille, France

2019 **INFORMS Conference**, *A Convex Optimization Approach to Radiation Treatment Planning with Dose Constraints*, Seattle, WA

2019 **useR! Conference**, *CVXR: An R Package for Disciplined Convex Optimization*, Toulouse, France

2018 **useR! Conference**, *Disciplined Convex Optimization with CVXR*, Brisbane, QLD

2016 **useR! Conference**, *CVXR: An R Package for Modeling Convex Optimization Problems*, Stanford, CA

Honors and Awards

2018 **Chambers Statistical Software Award**, *Honorable Mention*

2016 **Stanford Graduate Fellowship**, *Stanford University*

2009 **Graduate Research Fellowship**, *National Science Foundation*

Industry Experience

2014–2016 **Machine Learning Scientist**, *H2O.ai*, Mountain View, CA
Led the design, implementation, and testing of generalized low rank models (GLRM) on H2O, a Java-based distributed statistical software engine.

2013 **Summer Intern**, *H2O.ai*, Mountain View, CA
Initiated and led the development of the H2O R package, which allows users to fit statistical models in H2O via a REST API.

2011 **Summer Intern**, *Economics and Social Systems, Yahoo! Research*, Berkeley, CA
Constructed a game theoretic model of market competition when firms have access to targeted advertising technology and analyzed its Nash equilibria.

2008 **Engineering Technician**, *Naval Research Laboratory*, Washington, DC
Collected and analyzed Raman spectra from dielectric core nanowires. Determined optimal Ag deposition time on retroreflector beads coated with SERS-active nanoparticles for greatest signal intensity.

Teaching Experience

Summer 2020 **EE364A: Convex Optimization I**, *Stanford University*, Teaching Fellow
Principal instructor for a class of 100 students from a diverse range of backgrounds. Delivered lectures, designed exams, led discussions of problem sets, and supervised a team of 6 course assistants/graders.

Winter 2020 **EE364A: Convex Optimization I**, *Stanford University*, Course Assistant

Spring 2012 **OIT268: Making Data Relevant**, *Stanford Graduate School of Business*, Course Assistant

Autumn 2007–2008 **ENEE114: Programming Concepts for Engineers**, *University of Maryland, College Park*, Undergraduate Teaching Fellow

References

○ **Stephen P. Boyd**
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350 Jane Stanford Way
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Stanford University School of Medicine
875 Blake Wilbur Drive
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○ **Balasubramanian Narasimhan**
Senior Research Scientist, Department of Statistics
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