

# Arvind S. Rao, PhD

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<b>Contact Information</b>	*****@****.com Mainz, Germany	website: <a href="#">rao.im</a> <b>Citizenship: United States of America</b>
<b>Education</b>	The University of Iowa, Iowa City, IA Ph.D., Mathematics Dissertation: “ <a href="#">Weak solutions to a Monge-Ampère type equation on Kähler surfaces</a> ” Area: Geometric Analysis, Differential Geometry  Georgia Institute of Technology, Atlanta, GA B.S., Electrical Engineering	May 2010      May 2002
<b>Skills</b>	Projects – <a href="#">on github.</a> Programming Languages – C++ (experienced with VXL/VNL, ITK, VTK, and Boost libraries(only spherical harmonic functions) ), MATLAB, MAPLE, Javascript, Ruby, Python, SQL (Postgres, Microsoft, etc.), BASH. Software – Sublime, Git, RubyMine, $\LaTeX$ , and Microsoft Office Suite. Experienced with Ubuntu Linux, Max OS, and Windows OS.	
<b>Industry Positions</b>	Data Scientist San Francisco, CA	<b>Riviera Partners</b> February 2013 – September 2015  <ul style="list-style-type: none"><li>• Lead development of candidate to job matching system. Applied statistical machine learning techniques to understand performance of and to further evolve the matching system.</li><li>• Was completely embedded in the software engineering team. I worked directly on the main app, implementing the matching feature, maintaining and extending the search function (elasticsearch), as well as fixing bugs.</li><li>• Was responsible for development of candidate scoring and matching methodologies. Wrote a service in Python to compute and expose scores. I completely refactored the existing service, leading to 20 fold speed up.</li><li>• Worked with data analysts to derive insights from candidate activity and placement data.</li><li>• On all projects I was responsible for data cleaning, normalization, and modeling.</li></ul>  Software Engineer (contractor) San Francisco, CA
		<b>Ark.com</b> October 2012 – January 2013  <ul style="list-style-type: none"><li>• Planned computer vision products to resolve entities across social networks. Curated a set of images for testing. Implemented histogram computation and comparison in Python OpenCV.</li><li>• Gained experience using GitHub, participating in the code review process, and generally working on a software development team.</li><li>• Wrote web crawlers to acquire data from social networks. From which, I learning about web architectures, and how to use proxies to crawl the social web fast.</li></ul>

**Research and  
Teaching  
Experiences**

Postdoctoral Researcher  
Philadelphia, PA

**University of Pennsylvania**  
[Section of Biomedical Image Analysis](#)  
2010 – 2012

- Conduct research into new statistical measures of 3D brain MRI in order to better classify pathologies of neurodegenerative diseases.
- Created a new clinically relevant mathematical contrast measure for diffusion imaging, which outperformed other measures. Statistical analysis was done with this measure to find significantly different brain regions, within a population of patients and normal subjects.
- Used machine learning to aid assessment of group difference within a population represented by brain connectivity graphs.
- Implemented experiments and methods in C++, MATLAB, MAPLE, and PYTHON.
- Wrote papers describing methods and experimental results in L<sup>A</sup>T<sub>E</sub>X and MS Word.
- Wrote BASH and PYTHON scripts for interaction with grid engine computers and image processing tasks.

Graduate Teaching Assistant  
Iowa City, IA

**University of Iowa**  
2003 – 2009

- Course instructor for Algebra II, during fall semester of 2006.
- Led two discussion sections, and each met biweekly. Wrote and graded quizzes. Also graded homework assignments.
- Assisted students of Engineering Calculus II with Mathematica assignments.
- Provided one-on-one tutoring for students enrolled in University of Iowa mathematics courses ranging from Algebra I to Multivariate Calculus.
- Wrote solutions to homework assignments for Differential Geometry of Curves and Surfaces (Fall 2006, Spring 2008) and Real & Complex Analysis II (Spring 2008).

**Fellowships and  
Service**

- Member of the University of Pennsylvania Biomedical Postdoc Community Service Committee, May 2011 - Present.
- NSF–VIGRE Traineeship, Spring Semester 2009.
- University of Iowa Graduate College Summer Fellowship, Summer Semester 2008.
- Volunteered at Iowa high school mathematics competition, hosted by the University of Iowa Mathematics Department, during the spring of 2006 and 2007.

**Publications**

1. Arvind Rao, [“Weak Solutions to a Monge-Ampère Type Equation on Kähler Surfaces.”](#) PhD Dissertation, University of Iowa, 2010.
2. Arvind Rao, Alex R. Smith, Robert Schultz, Timothy P.L. Roberts, and Ragini Verma, “Peak Geodesic Concentration: A Measure of WM Complexity”, Proceedings of MMBIA 2012.
3. Arvind Rao, Madhura Ingahalikar, Alex R. Smith, Timothy P.L. Roberts, and Ragini Verma, “Statistical Analysis on the GEMS-Manifold of Connectivity Graphs”, Proceedings of MICCAI 2012 (submitted).
4. Arvind Rao, Alex Smith, Robert Schultz, Timothy Roberts, and Ragini Verma, “Geodesic Concentration: A Measure of Diffusion Concentration”, (submitted to Computers in Biomedicine)

**Selected  
Conferences and  
Presentations**

[IEEE Workshop on Mathematical Methods in Biomedical Image Analysis](#)  
Breckenridge, CO

January 2012

- Poster presentation of, “Peak Geodesic Concentration: A Measure of WM Complexity”, which is based on a postdoctoral research project of mine.

Geometric Partial Differential Equations  
Institute for Advanced Study, Princeton, NJ

February 2009 – May 2009

- While in residence, I wrote my dissertation, presented a paper in an advanced topics PDE courses, and attended seminars.

Differential Geometry Seminar  
University of Iowa, Iowa City, IA

September 2006 and 2007

- Two presentations on global estimates for a Monge-Ampère type equation, my dissertation research project.
- Three presentations about the Calabi Conjecture based on lectures notes by Yum-Tong Sui.
- Four presentations based on the John Lee and Thomas Parker exposition of the Yamabe Problem.