

CURRICULUM VITAE

Pedram Safari

EMPLOYMENT

MGH INSTITUTE OF HEALTH PROFESSIONS, Boston, MA. Course developer and term lecturer, 2023–.

HARVARD UNIVERSITY, Cambridge, MA. Harvard Summer School, summers 2007–2011, 2016–2023.
Research Associate, 2016–2019.
Preceptor, 2008–2016.
Visiting Scholar/Lecturer, 2007–2008.

THE INSTITUTE FOR QUANTITATIVE SOCIAL SCIENCE (IQSS), HARVARD UNIVERSITY.
Visiting Fellow/Scholar, 2015–2019.

THE ABDUS SALAM ICTP, Trieste, Italy. Visiting Fellow, 2004–05.

INSTITUTE FOR STUDIES IN THEORETICAL PHYSICS AND MATHEMATICS (IPM), Tehran, Iran. Post-doctoral Research Fellow, Fall 2001–Spring 2004.

SHARIF UNIVERSITY OF TECHNOLOGY, Tehran, Iran. Assistant Professor, 2000–2001.

COLUMBIA UNIVERSITY, New York. Departmental Representative, Summers of 1999 and 2000; Preceptor, 1999–2000.

EDUCATION

COLUMBIA UNIVERSITY, New York, NY. Ph.D. in Mathematics, May 2000.

SHARIF UNIVERSITY OF TECHNOLOGY, Tehran, Iran. B.S. in Mathematics, *summa cum laude*, June 1993.

Teaching

CURRICULUM DEVELOPMENT

As a preceptor at Harvard, I developed an analytic curriculum for students in social sciences, acting as a liaison between various schools and departments across the university (including psychology, public health, education, statistics, mathematics and government), consisting of several components:

- Developing a sequence of two courses, *Basic/Intermediate Mathematics for Social Scientists*, spanning a full academic year, to cover the essential mathematical needs for such students;
- Mentoring and advising graduate students in their independent studies, projects, and theses — some of the topics covered include: *calculus of variations, equilibriums in game theory, Itô's lemma in stochastic processes and Black-Scholes equation, Logistic Normal Topic model, currency exchange in political economy, Diffusion Tensor Imaging, Artificial Intelligence, Fourier transforms, and Social Choice theory.*
- Developing and organizing [workshops](#) (mini-courses) on various advanced or specialized topics of interest, such as
 - Fair division
 - Voting theory
 - Network theory
 - Markov chains
 - Dynamical systems
 - Fixed point theorems (with an eye to game theory and social choice theory)
 - Principal component analysis

COURSES

- Application of Analytics, MGH IHP, Fall 2023.
- Intermediate Mathematics for Social Scientists [*developed*], Harvard University, Spring 2009–2016.
- Basic Mathematics for Social Scientists [*developed*], Harvard University, Fall 2008–2015.
- Pre-Calculus (Math S-Ar), Harvard University, Summers 2007–2011, 2016–2023. Also as College Algebra and Trigonometry, Columbia University, 1998–2000, Summers 1997 & 1998.
- Calculus for Business and Economics, Northeastern University, Fall 2007.
- Introduction to Modern Analysis, Sharif University of Technology, Spring 2001. Also at Columbia University, Summers 1999 and 2000.
- Matrices and Computers, Stevens Institute of Technology, Summer 1998.
- Calculus II A, Columbia University, Summer 1996.
- Elementary Differential Topology, Sharif University of Technology, Spring 1994.

- Introduction to Seiberg-Witten theory (graduate), Harvard University, Fall 2007, followed by
- Topics in Seiberg-Witten theory (graduate), Harvard University, Spring 2008.
- Geometry of Manifolds II (graduate), Sharif University, Spring 2001, followed by
- Topics in the Geometry of Manifolds (graduate), Sharif University, 2001–02.

THESIS SUPERVISION

- Amin Gholampour, *Symplectic Thom Conjecture, a review of the work of Szabó and Ozsváth*, M.S. thesis, Sharif University, July 2002.
- Seyyed Mohsen Khalkhali, *Finslerian Geometry as a Generalization of Riemannian Geometry*, M.S. thesis, Sharif University, Oct. 2001.

HONORS

Harvard University [Certificate of Teaching Excellence](#), awarded by the Derek Bok Center for Teaching and Learning, Fall 2014.

Research

SELECTED BIBLIOGRAPHY

- *Entropy Removal of Medical Diagnostics* (joint with Shuhan He and Paul Chong (first authors), et al.). Submitted, 2023.
- *Future exchange rates and Siegel's paradox* (joint with Keivan Mallahi-Karai), Global Finance Journal, vol. 37 (Aug. 2018), 168–172. [doi: 10.1016/j.gfj.2018.04.007](https://doi.org/10.1016/j.gfj.2018.04.007).
- *Spatial remapping without gain fields: a neural model based on cortico-thalamic connectivity* (joint poster with Baktash Babadi, Nan Jia and Arash Yazdanbakhsh), 36th European Conference on Visual Perception, August 2013, Bremen, Germany.
- *Relative Seiberg-Witten invariants and a sum formula* (joint with Mohammad Farajzadeh-Tehrani), [arXiv:2009.09531 \[math.DG\]](https://arxiv.org/abs/2009.09531).

- *Gluing Seiberg-Witten moduli spaces* (mathematical monograph), Lambert Academic Publishing, 2010. ISBN: 978-3-8383-2763-1.
- *Gluing Seiberg-Witten monopoles*, Comm. An. Geom., vol. 13 (2005), no. 4, 697–725. doi: [10.4310/CAG.2005.v13.n4.a3](https://doi.org/10.4310/CAG.2005.v13.n4.a3).
- *e-Publishing* (survey article in Persian), Nashr-e Riyazi **26**, vol. 14 (2003), no. 1, 17–34.
- *What is Seiberg-Witten theory?* (expository article in Persian), Nashr-e Riyazi **23**, vol. 12 (2001), no. 1-2, 4–11.
- *A gluing theorem for Seiberg-Witten moduli spaces*, Dissertation Committee: Masatake Kuranishi, Brian Mangum, John W. Morgan (advisor), Tomasz S. Mrowka, Duong H. Phong (Chair).

SELECTED TALKS

- *Seiberg-Witten Equations with Multiple Spinors*, Algebra/Topology Seminar, [Department of Mathematics, SUNY at Albany, NY](#); August 28, 2014.
- *Seiberg-Witten monopoles and 4-manifold surgery*, Algebraic Geometry Seminar, [Department of Mathematics, CalTech](#), Pasadena, CA; May 5, 2008.
- *Gluing Monopoles*, Differential Geometry and Geometric Analysis Seminar, [Department of Mathematics, Princeton University](#), Princeton, NJ; December 7, 2007.
- *Gluing Seiberg-Witten Monopoles: an outline*, Gauge Theory and Topology Seminar, [Department of Mathematics, Harvard University](#), Cambridge, MA; March 23, 2007.
- *Gluing Seiberg-Witten Monopoles*, [Fakultät für Mathematik, Universität Bielefeld](#), Germany; October 18, 2005.
- *Gluing Seiberg-Witten Monopoles: a mathematical approach*, [The Abdus Salam ICTP](#), Trieste, Italy; March 31, 2004.
- *Floer Homology and Novikov Rings*, Columbia Gauge Theory Seminar, June 1997.
- *Complex Analysis: The Geometric Viewpoint*, Sharif University of Technology, Tehran, Iran, 1993. A series of lectures, jointly with Saeed Zakeri, based on a book by S. Krantz.
- *Perturbations of Hamiltonian Systems and Abelian Integrals*, Dynamical Systems Seminar, Sharif University of Technology, 1992.
- *Linear Flows in the Complex Domain*, weekly colloquium, Sharif University of Technology, 1991.

SELECTED VISITS WITH SUPPORT

- Workshop on Geometric Evolution Equations, March 12–16, 2007. MSRI, Berkeley, CA. On NSF and FRG grants.
- CMI Summer School on Ricci Flow, 3-manifolds and Geometry, June 20 – July 15, 2005. MSRI, Berkeley, CA. On Clay Institute support.
- CMI Summer School on Floer Homology, Gauge Theory, and Low Dimensional Topology, June 6–26, 2004. Alfréd Rényi Institute of Mathematics, Budapest, Hungary. On Clay Institute support.
- [Mathematical Challenges of the twenty-first century](#), August 7–12, 2000. An AMS meeting at the University of California, Los Angeles. On an NSF travel grant.
- Conference on Geometry and Topology, in honor of Atiyah, Bott, Hirzebruch and Singer, May 14–16, 1999. Harvard University, Cambridge, MA. Sponsored by J. of Differential Geometry.

Professional

SELECTED ACTIVITIES

- Member of the Editorial Board of [Nashr-e Riazi](#), an expository math journal in Persian. Tehran, 2002–2005.
- Reviewer for the *Mathematical Reviews*, since January 15, 2004.
- Member of the Scientific Committee of the 2nd Iranian Geometry-Topology Conference. Amir-Kabir University, Tehran, February 3–5, 2003.
- Co-editor of [Shahyad](#), a festschrift in honor of S. Shahshahani's 60th birthday. Published in May 2002 by Sharif University Press.
- Providing Persian sub-titles for the movie "Dimensions" (joint with Leila Khatami). This movie is a mathematical exposition for the general public, produced with an international collaboration and translated to over 19 languages in its upcoming edition. The website of the movie is at <http://dimensions-math.org/>.

COMPUTER SKILLS

- Well acquainted with Mac, UNIX and Windows operating systems and line commands, as well as setting up servers and networks.
- Proficiency in LaTeX, Mathematica, Tableau, Desmos and Emacs.
- Algorithmic and object-oriented programming and languages (such as R).
- Working knowledge of various word-editing/sketching apps and data processing softwares.
- Familiarity with various Apple, Adobe and Microsoft applications and iOS automations.

LANGUAGES

Persian (native), English (fluent), French (good; [DELTA](#): A2), Italian (fair), Arabic (good in reading), German (fair in reading), LaTeX, R, HTML, Java.

References

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