

# NIKHIL ADDLEMAN

## Applied mathematics and statistics

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🌐 inhomogeneo.us

## EDUCATION

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PhD (Mathematical Behavioral Sciences)

University of California Irvine

📅 August 2015 – September 2021

- Uncovered novel statistical results in the religious demography.
- Designed and developed mathematical models for evolutionary game theory research.
- Consulted by colleagues on machine learning and optimization problems: Recommended distance metrics for high-dimensional clustering problem and explained how it could be made parallel, cutting a weeks-long computation in half.

BS (Mathematics)

University of New Mexico

📅 August 2011 – June 2015

- Presented original work on stochastic effects in epidemic models.

## EXPERIENCE

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Research Assistant

Economics Department, UC Irvine

📅 March 2019 – June 2019 📍 Irvine, CA

- Implemented dynamical economic models in Python to validate theoretical work and produce figures for publication.

Teaching Assistant

School of Social Sciences, UC Irvine

📅 September 2015 – June 2021 📍 Irvine, CA

- Communicated scientific and statistical concepts to undergraduates.
- Advised and mentored several students on research and career/graduate school.

## TECHNICAL SKILLS

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- Dynamical systems, (geospatial) statistics, machine learning, applied mathematics, network models
- Python (NumPy, Pandas, scikit-learn), Julia, Clojure, R, SQL, Git

## PERSONAL SKILLS

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- Excellent scientific communication to both experts and nonexperts.
- Comfortable designing and leading research programs.
- Welcoming and knowledgeable colleague.

## WORKING PAPERS

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**Geographic Diversity in US Religious Denominations**

- Characterized the distribution of USA religious groups at the denominational level. The first use of geospatial measures of autocorrelation in religious studies.

**Chaos in a simple evolutionary model**

- Presented a maximally simple population model with chaotic solutions illuminating chaotic phenomena in the social and biological sciences.

**Convergence to equilibrium in a color-matching game**

- Developed an agent-based model to simulate a color-matching game and implemented network statistics including spectral graph theory to analyze results.

**Invasion Dynamics in Coordination Games Played on Networks**

- Networks of agents playing economic games enable inefficient strategies to invade. This paper presents an infinite family of graphs susceptible to invasions beginning at particular vertices.

## CURRENT RESEARCH

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**Slices in random geometric graphs**

- Aims to characterize the geometric distribution of edges in random graphs.

**Probabilistic ranking of moral concepts**

- Implemented scientifically-grounded clustering algorithms and statistical analyses for rank-order survey data.

**Heterograms**

- Finding sentences that use each letter exactly once is NP-hard, but heuristics may make the search problem computationally tractable.