Sina Sajjadi

Education

2021–present **Ph.D in Network and Data Science**, *Complexity Science Hub Vienna and Central European University*, Vienna.

2016–2019 **M.Sc in statistical physics and complex systems**, *Sharif University of Technology* **First QS ranked** *University in Iran*, Tehran.

2011–2016 **B.Sc in Physics**, *Ferdowsi University of Mashhad*, Mashhad.

Languages

- **Persian:** Native
- **German:** Beginner
- **English:** Advanced
- **Arabic:** Beginner

Programming Languages and Related

Languages C/C++ • Python (Numpy-Matplotlib-Scipy-Pandas-Sklearn-NLTK) • R • NetLogo • Bash • Mathematica

Related Git • Parallel Computing (MPI, OpenMP, Python's multiprocessing, mpi4py) • HPC (PBS)

Research Interests

- Network Science - Temporal Networks
- Social Inequality
- Sociophysics
- Game Theory
- Epidemic Processes
- Statistical Inference
- Information Theory
- Machine Learning and Clustering

Software development

2017–present **EPYC** Versatile software written in C++ and Python for simulating various compartmental epidemic models on static and temporal networks.
Available under GPL-3.0 at https://github.com/Sepante/Epyc

Honors and Awards

Apr 2021 2nd **place award** of the **Neglected Tropical Diseases (NTD) Hackathon**, held by **Task Force for Global Health** working on a solution for challenges surrounding rumors/misinformation relating to mass drug administrations.

Sep 2020   Winner of **HackZürich 2020** *Enhance Digital Services With Data* challenge for developing **DSNM web-app** *Fraud Detector and Recommender system for Fitness Activities*, working on the Helsana+ database.

Sep 2020 2nd **place award** for the scientific video contest of **Dynamics of biological systems:** from viruses to populations **conference**, held by **Jagiellonian University** For **This animation** depicting *Social distancing in pedestrian dynamics and its effect on disease spreading.*

Jun 2020 2nd **project award** in the **Exploring Network Epidemiology** in the Time of Coronavirus, online workshops held by **University of Maryland** and **Vermont's Complex Systems Center** among **29 groups**. Project title: *Racial disparities in COVID-19 cases: Beyond inherent vulnerability.*

Media Coverage

2021   My project "**Rumor Detection and Prevention**" for Neglected Tropical Diseases - Hackathon is covered by the **National Public Radio**. My group utilized sentimental analysis to detect high rumor regions and performed network analysis on both the high risk activities and also to find influential individuals within the communities. We also designed a board game, to educate the kids on the topic of neglected tropical diseases.

Research Visits

Feb 2018   Visiting researcher **Empirical networks and neurodynamics group, Technische Universität Berlin.**

Teaching and Work Experience

June 2020   **Speaker** for **Schelling Algorithm** Implementation and Visualization, two day workshop held virtually in the department of Physics, Sharif university of technology, Tehran-Iran. Codes ***here***.

2019–2020   **Teaching Assistant** for **Modeling of Spreading Phenomena** MSc course at Sharif university of technology, Tehran, Iran.

2019–2020   **Data Analyst** in **Statsminute** working on foreign travels and housing market data in order to retrieve Iranian population's Income status. Tehran-Iran.

2019   **Teaching Assistant** for **Computer Simulations in Physics** MSc course at Sharif university of technology, Tehran, Iran.

2019   **Teaching Assistant** for **Special Topics in Complex Systems**, covering topics in **network science** and **social media analysis**, MSc course at Sharif university of technology, Tehran, Iran.

Aug 2018 **Junior speaker** for Tehran school on Theory and Applications of **Complex Networks** giving a talk on **Simulating Disease Spreading Models using Python** held in the department of Physics, Shahid Beheshti University, Tehran-Iran

Spring 2018 **Teaching Assistant** for the 6th **Collaborative Scientific Software Development and Management of Open Source Scientific Packages** held by **ICTP** (International Centre for Theoretical Physics) in Tehran, Iran.

2017 **Teaching Assistant** for Basic Physics I and Basic Physics II at Sharif university of technology, Tehran, Iran.

Selected Schools, Courses, Workshops and Conferences

- **IC2S2**, to be held on July 2022 at the University of Chicago, Chicago, United States. (*to attend*) Contribution: A contributed talk and a poster.
- **Mathematics of Large Networks Summer School**, held by Erdős Center, *to attend* on June 2022 in Budapest, Hungary.
- **Mathematics of Large Networks Workshop**, held by Erdős Center, on May 2022 in Budapest, Hungary. Contribution: A contributed talk.
- **Conference on Complex Systems**, held by Complex Systems Society, October 2021. Contribution: A poster presentation.
- **IceLab Camp** workshop held by **Umeå University** on **Interdisciplinary Science and Collaboration**, September 2021 in Umeå, Sweden.
- **Behavioral Digital Trace Data in Response to the COVID-19 Pandemic** summer school held by The **Social ComQuant** July 2021.
- **Reinforcement Learning Summer School** workshop held by The **Alan Turing Institute** June 2021.
- **Winter Lecture Series** workshop held by **CSH** (Complexity Science Hub Vienna) on **Cultural Data Science, Computational Social Science, High Order Networks, Randomness and Innovation Dynamics** and **Statistical learning theory**, March 2021.
- **Advances in Applied Probability** workshop held by **ICTS** (International Centre for Theoretical Sciences) on **High dimensional computation** and **Statistical learning theory**, January 2021.
- **Conference on Complex Systems**, held by Complex Systems Society, December 2020. Contribution: A talk and a poster presentation.
- **Dynamics of biological systems**: from viruses to populations conference, held by Theory of Complex Systems Department, September 2020. Contribution: Paper presentation. **Jagiellonian University**
- **HackZürich 2020**, September 2020, Contribution: Developing [DSNM web-app](#) *Fraud Detector and Recommender system for Fitness Activities*, working on the Helsana+ database, **winning the *Enhance Digital Services With Data* challenge**.
- **Oxford Summer School in Economic Networks** on, **social networks, games and learning, financial networks, economic complexity, urban systems, and innovation** June 2020, Contribution: Poster presentation.

- **Exploring Network Epidemiology** in the Time of Coronavirus, online workshops held by **University of Maryland** and **Vermont's Complex Systems Center**, April 2020, Contribution: Group project.
- CODATA-RDA **School of Research Data Science for alumni**, on training the alumni to share their learning and to train others. Virtually held by ICTP, CODATA and RDA, Sep 2020.
- CODATA-RDA **Research Data Science Summer School** on Research Data management, Open Science, Machine Learning, Computational Infrastructures. at **ICTP** (International Centre for Theoretical Physics), 2019, Trieste, Italy.
- CODATA-RDA Research Data Science Advanced Workshops on **Extreme Sources of Data on data-analysis, software development and tools for analysis and reproducible science and sharing.** at **ICTP**, 2019, Trieste, Italy.
- Summer research program on **Dynamics of Complex Systems** held by **ICTS** (International Centre for Theoretical Sciences) on **Game Theory, Genetic Algorithms, Network Analysis, Time Series Analysis**. I alongside some other participants prepared lecture notes *here*, 2019, Bengaluru, India.
- **Spring College on the Physics of Complex Systems at ICTP**, Trieste, Italy. (Full Mark, All courses passed, reinforcement learning, polymer physics, statistics of extremes, non-equilibrium quantum mechanic, hierarchical learning).
- 5th Workshop on **Collaborative Scientific Software** Development and Management of Open Source Scientific Packages held by **ICTP**. *(I was a teaching assistant, the next year.)*
- **Complex quantum systems out of equilibrium in many-body physics and beyond** conference held by **ICTP**, Yerevan, Armenia.
- 8th **IPM-HPC** workshop on **multi-core systems and parallel platforms**, Tehran, Iran.

Publications

- **Impact of temporal correlations on high risk outbreaks of independent and cooperative SIR dynamics** Sina Sajjadi, Mohammad Reza Ejtehadi, Fakhteh Ghanbarnejad, **Plos One** 16.7 (2021): e0253563. **Link Here**.

- **Social distancing in pedestrian dynamics and its effect on disease spreading** Sina Sajjadi, Alireza Hashemi, Fakhteh Ghanbarnejad, **Physical Review E** 104.1 (2021): 014313. **Link Here** - **arXiv:2010.12839**

- **Structural inequalities exacerbate infection disparities: A computational approach** Sina Sajjadi, Pourya Toranj Simin, Basak Taraktas, Mehrzad Shadmangohar, Ulya Bayram, Mavi Ruiz, Fariba Karimi, *under review*. **arXiv:2205.04361**.

- **Modified Heider Balance Model on Random Networks** Razieh Masoumi, Farideh Oloomi, Sina Sajjadi, Amirhoseein Shirazi, Gholamreza Jafari, *under review*. **arXiv:2204.04469**

Conference Proceedings

Talks

- **Structural inequalities exacerbate infection disparities: A computational approach** Sina Sajjadi, Pourya Toranj Simin, Mehrzad Shadmangohar, Basak Taraktas, Ulya Bayram, Maria V. Ruiz-Blondet, Fariba Karimi, accepted for **IC2S2 2022**.

- **Misinformation: Detection and Hindering** Sina Sajjadi, Alireza Hashemi, Yasaman Asgari, Saeed Hedayatian, presented at **meeting of the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD)** November 2021.

- **Investigating social distancing via Agent Based Modeling** Sina Sajjadi, Alireza Hashemi, presented at **Workshop on Sociophysics: Social Phenomena from a Physics Perspective** held by **ICTP-SAIFR**, October 2021.

- **Infection disparity explained by socioeconomic status and segregation: An agent based model** Sina Sajjadi, Pourya Toranj Simin, Basak Taraktas, Mehrzad Shadmangohar, Ulya Bayram, Mavi Ruiz, presented at **NETWORKS 2021**.

- **k-means clustering method for coinfective spreading risk calculation** Sina Sajjadi, Reza Ejtehadi, Fakhteh Ghanbarnejad, presented at the **Conference on Complex Systems**, 2020.

- **Social distancing in pedestrian dynamics and its effect on disease spreading** Sina Sajjadi, Alireza Hashemi, Fakhteh Ghanbarnejad, presented at the **DPG Conference**, 2021.

- **Surviving the Pandemic: The Effect of socioeconomic disparities on epidemic infection rates** Sina Sajjadi, Ulya Bayram, Basak Taraktas, Mehrzad Shadmangohar, Mavi Ruiz, Pourya Toranj Simin, presented at **Mitchell Centre SNA, University of Manchester, webinar series**, November 2020.

- **Agent based modeling of direct and indirect transmission** Sina Sajjadi, Alireza Hashemi, Fakhteh Ghanbarnejad, presented at **Dynamics of biological systems Conference** held by **Jagiellonian University**, September 2020.

- **An analysis of the Turkish Workers' Protests During Covid-19** Basak Taraktas, Sina Sajjadi, presented at the **International Conference of Europeanists**.
- **Protesting during the Covid: When economic deprivation overweighs contagion risk** Basak Taraktas, Sina Sajjadi, presented at the **Midwest Political Science Association Conference**.
- **Initial spreaders and evolution of epidemic dynamics on a hospital network** Sina Sajjadi, Fakhteh Ghanbarnejad, Mohammad Reza Ejtehadi, 4th **Iranian Computational Physics Conference**.

Poster Presentations

- **Epidemic Infection Disparity Explained By Segregation and Socio-economic Inequality, a Multilayer Agent Based Model** Sina Sajjadi, Ulya Bayram, Basak Taraktas, Mehrzad Shadmangohar, Mavi Ruiz, Pourya Toranj Simin, presented at **Conference on Complex Systems**, 2021.
- **Effectiveness of social distancing through the lens of agent based modelling** Sina Sajjadi, Alireza Hashemi, Fakhteh Ghanbarnejad, presented at **Conference on Complex Systems**, 2020.
- **COVID-19 in Iran** Yazdan Babazadeh, Amin Safaeesirat, Yasaman Asgary, Adib Khazaee, Fatemeh Zarei, Sina Sajjadi, Alireza Hashemi and Fakhteh Ghanbarnejad, presented at **NETSCI 2020**.
- **Impact of temporal correlations on high risk outbreaks of independent and cooperative SIR dynamics** Sina Sajjadi, Fakhteh Ghanbarnejad, Mohammad Reza Ejtehadi presented at ***The Oxford Summer School in Economic Networks.***
- **Interactive dynamics vs. bursty networks** Sina Sajjadi, Fakhteh Ghanbarnejad, Mohammad Reza Ejtehadi, and Fariba Karimi presented at ***2017 joint meeting of the DPG and EPS***.
- **Effects of Temporal Correlations on Co-Infection** Sina Sajjadi, Fakhteh Ghanbarnejad, Mohammad Reza Ejtehadi presented at ***CODATA-RDA*** Research Data Science Summer School, Trieste, Italy.

Popular Science

I write about Philosophy of Science on Filsoof meaning "The Philosopher" in Persian.

General Interests

- Mathematics
- Analytic Philosophy
- Philosophy of Mind
- Literature
- Political Sciences

- Mythological Studies
- Philosophy of Science
- Philosophy of Ethics
- Sociology
- Learning Languages

References

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