



PROFILE

Passionate physicist with a strong foundation in **problem-solving skills**, **mathematical modeling**, and **analytical thinking**. Experienced in **simulation** and study of various dynamical systems, employing **computational methods**, analyzing and interpreting **data**, and effective data **visualization**, with proficient coding skills in **C/C++**, **Python**, and **MATLAB**. More than 4 years of experience in **machine learning**, specifically (**deep**) **reinforcement learning**, by applying it to cutting edge **research** on active matter physics. Also, familiar with underlying mathematics and implementation of different **neural network** models, including, FCN, CNN, Boltzman machines, Autoencoders, and Reservoir computers. Possessing over a decade of **teaching experience** in various settings, and **presenting** scientific results in several **international conferences**, gives me the confidence in **communication** and skills to convey **technical information** in simplified terms. **International collaboration** with people from diverse backgrounds has made me efficient in **teamwork**. Moreover, having experience of working in different roles such as CEO, organizer, and journal editor, has enhanced my **leadership skills**.

HOBBIES

Astrophotography, Calligraphy, Camping.

CONTACT DETAILS

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(See extended version of my CV on my homepage)

EDUCATION

Ph.D. in Physics. *University of Gothenburg, Sweden.* Jan. 2020 - May 2024

Thesis title: *Microswimmer navigation in turbulence*

M.Sc. in Physics. *Shiraz University, Iran.* Sep. 2016 - Sep. 2018

Thesis title: *Statistical properties of particle spread in random media.*

B.Sc. in Physics. *Shiraz University, Iran.* Sep. 2011 - Sep. 2016

Thesis title: *Kuramoto model simulation of a system of oscillators.*

EXPERIENCE

Doctoral Researcher at GU (Gothenburg, Sweden) Jan. 2020 - May 2024

Studied optimal navigation strategies of microswimmers in turbulent flows. The work included statistical physics, fluid mechanics, dynamical systems and machine learning.

Researcher at Beheshti University (Tehran, Iran) Jul. 2019 - Dec. 2019

Studied the first-passage time statistics of generation of new pages in Wikipedia as a complex network. Used Python API for Wikipedia for data collection and analysis.

Data scientist at Tarjoman Club (Shiraz, Iran) Sep. 2018 - Dec. 2018

Built a database of best selling books, separated in translated/non-translated (to Persian) groups. Used Python web-scraping libraries such as BeautifulSoup to collect the data and MongoDB for database.

CEO, Developer at Satvis Institue (Shiraz, Iran) Jan. 2016 - Oct. 2019

Co-founded an institute for teaching astronomy using virtual reality glasses. Developed the framework for the courses, developed material and videos, and taught the courses.

Web developer at Biruni Observatory (Shiraz, Iran) Sep. 2017 - Jan. 2018

Collaborated as a developer of the observatory's website ([See](#)).

Researcher at Biruni Observatory (Shiraz, Iran) Sep. 2013 - Apr. 2016

Studied variable stars by photometry. Observation and data collection with large scale telescopes. Data reduction and analysis with various astronomical packages and software.

SKILLS

Coding: C/C++, Python, MATLAB, Octave, Mathematica

Tools: GIT, TensorFlow, Pytorch, scipy, numpy, pandas, BeautifulSoup, JSON, HDF5

Text and Visualization: \LaTeX , Microsoft word, matplotlib, plotly, GIMP, Inkscape

TEACHING

Chalmers and University of Gothenburg Sep. 2020 - Dec. 2023

Artificial neural networks ([info](#)), Dynamical systems ([info](#))

Shiraz University Sep. 2013 - Sep. 2018

Computational physics, Thermodynamics, Mechanics, Electromagnetism

Biruni Observatory Sep. 2013 - Sep. 2018

Astrophysics, Cosmology, Observational astronomy and instrumentation

Satvis Institue Jan. 2016 - Oct. 2019

Astronomy

PUBLICATION

Short term vs. long term: optimization of microswimmer navigation on different time horizons

N. Mousavi, J. Qiu, B. Mehlig, L. Zhao, K. Gustavsson, submitted to Physical Review X Life, **2024**

Efficient survival strategy for zooplankton in turbulence

N. Mousavi, J. Qiu, B. Mehlig, L. Zhao, K. Gustavsson, Physical Review Research 6 (2), L022034, **2024**

Active gyrotactic stability of microswimmers using hydromechanical signals

J. Qiu, **N. Mousavi**, L. Zhao, K. Gustavsson, Physical Review Fluids, 7 (1), 20, 014311, **2022**

Navigation of micro-swimmers in steady flow: the importance of symmetries

J. Qiu, **N. Mousavi**, K. Gustavsson, C. Xu, B. Mehlig, L. Zhao, Journal of Fluid Mechanics, 932, 21, A10, **2021**

Synchronization in coupled phase oscillators with asymmetric interaction

N. Mousavi, M. G. N. Haghighi, S. Bazmi, Annual Physics Conference of Iran, **2016**

Light curve and maximum time report of SX Phe star AE UMa

S. Hojjatpanah, **N. Mousavi**, S. M. Kazemi, Information Bulletin on Variable Stars (IBVS) No. 6199, **2014**