# Alireza Motazedian

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## Highlights

- **Machine Learning Researcher**: Dealing with noisy time-series data using Deep Learning and traditional Machine Learning algorithms. I am doing this project for the Electrical and Computer Engineering department, UNH.

- **Publications (28)**: **23** published (6 Journals & 17 full conference papers), **5** under preparation.

- **Computational Physics background**: All my research projects have been conducted through computational approaches using my home-made codes written in Fortran and C++.

- **Data Science background**: I have been learning scientific Python, R and Machine Learning algorithms from my co-author, Mostafa ([mostafa-mr.com](mostafa-mr.com)), a Data Science PhD candidate. Mostafa has been my co-author on all my publications. You can find Mostafa's recommendation on my behalf on my LinkedIn profile and at the end of my CV.

## Education

- PhD in Physics | 2022 – present | University of New Hampshire, NH, USA.
- MSc in Physics | 2010 – 2013    | Shahid Chamran University of Ahvaz, Iran.
- BSc in Physics  | 2005 – 2009    | Payame Noor University, Abadeh Branch, Iran.

## Professional experience

- 2023 – <u>Present</u>: **Machine Learning Researcher**: Dealing with noisy time-series data using Deep Learning and traditional Machine Learning algorithms. I am doing this project for the Electrical and Computer Engineering department, UNH.

- 2022 – 2023: Teacher Assistant at Physics department, UNH.

- 2019 – 2022: Research Assistance, Department of Physics, Shahid Chamran University of Ahvaz, Khuzestan, Iran.
    - My research work during these recent years has resulted in several papers, one of which has been submitted in 2021, the others will be submitted in 2023.

- 2015 – 2020: University Lecturer, Islamic Azad University, Ghaderabad, Iran.
    - BSc Level Courses: Fundamental of Physics (I & II), Electromagnetism (I & II).

- 2014 – 2020: Teaching Physics for Universities Entrance Exams Applicants (BSc & MSc).
    - BSc level courses: Fundamental of Physics (I & II), Electromagnetism (I & II).
    - High school level courses: Physics (Grades 10 & 11 & 12).

- 2013 – 2016: Research Assistance, Department of Physics, Shahid Chamran University of Ahvaz, Khuzestan, Iran.

o I was working on some papers that were published in 2014 - 2016.

# Published journal articles

1. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, and F. S. Jalil-Abadi, "A depleted and numerical model for pulsed Gaussian wave type II second harmonic generation," arXiv preprint arXiv:2112.13422 (2021).

2. M. Sabaeian (supervisor), **A. Motazedian**, M. Mohammad Rezaee, and F. Sedaghat Jalil-Abadi, "Bessel-Gauss beams: pulsed Bessel-Gauss beams: a depleted wave model for type II second harmonic generation," **Applied Optics** 53, 7691–7696 (2014).

3. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, F. Sedaghat Jalil-Abadi, H. Askari, and I. Khazrak, "Thermally induced phase mismatching in a repetitively Gaussian pulsed pumping KTP crystal: a spatiotemporal treatment," **Applied Optics**. 54, 4781-4788 (2015).

4. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, F. Sedaghat Jalil-Abadi, and A. Khaledi-Nasab, "Complete anisotropic time-dependent heat equation in KTP crystal under repetitively pulsed Gaussian beams: A numerical approach," **Applied Optics** 54, 1241–1249 (2015).

5. M. Sabaeian (supervisor), F. Sedaghat Jalil-Abadi, M. Mohammad Rezaee, and **A. Motazedian**, "Heat coupled Gaussian continuous-wave double-pass type-II second harmonic generation: inclusion of thermally induced phase mismatching and thermal lensing," **Optics Express** 22, 25615–25628 (2014).

6. M. Sabaeian (supervisor), F. Sedaghat Jalil-Abadi, M. Mohammad Rezaee, **A. Motazedian**, and M. Shahzadeh, "Temperature increase effects on a double-pass cavity type II second harmonic generation: a model for depleted Gaussian continuous waves," **Applied Optics** 54, 869–875 (2015).

7. M. Sabaeian (supervisor), F. Sedaghat Jalil-Abadi, M. Mohammad Rezaee, **A. Motazedian**, and M. Shahzadeh, "Temperature Distribution in a Gaussian End-Pumped Nonlinear KTP Crystal: The Temperature Dependence of Thermal Conductivity and Radiation Boundary Condition," **Brazilian Journal of Physics**, 0103-9733 (2015)

# Under preparation journal articles

1. **A. Motazedian**, M. Sabaeian (supervisor), M. Mohammad Rezaee, and F. Sedaghat Jalil-Abadi, "Investigation of efficiency and field profile of Bessel-Gauss beams in pulsed second harmonic generation under thermal effects".

2. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, and F. Sedaghat Jalil-Abadi, "Heat coupled type II long-pulse second harmonic generation: a model for inclusion of thermal phase mismatching and thermal lensing".

3. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, and F. Sedaghat Jalil-Abadi, "The efficiency changes of pulsed Gaussian second harmonic generation in KTP crystal: investigating the influences of pulse energy, laser spot size, cooling temperature by emphasizing the interaction length scale".

4. M. Mohammad Rezaee, M. Sabaeian (supervisor), **A. Motazedian**, and F. Sedaghat Jalil-Abadi, "Heat-pulsed second harmonic generation coupling: Reduction in RAM and run-time using algorithm optimization and parallel computing".

# Published Conference paper

I have published **17** full conference papers in national and international conferences.

# Skills

- Data Science and Scientific Programming:
  > Machine learning
  > FORTRAN, C++, MATLAB, Python (Pandas, Scikit-Learn) and R.
  > Acquainted with High Performance Computing (HPC).

- Mathematical Knowledge:
  > Computational modeling and analysis, Probability theory.

# References and LinkedIn Recommendations

**My Mentor and co-author** | since 2010 | Ali Khaledi, Ph.D., Research Scientist, **Amazon Web Service (AWS)**, San Francisco Bay Area, USA.
Email: Alinsb@amazon.com, Tel: +1 (740) 331-1349, Personal website: alikhaledi.com

**My co-author on 28 publications** | since 2010 | Mostafa MR, Data Science Ph.D. candidate, Bowling Green State University, OH, USA.
Email: mostam@bgsu.edu, Tel: +1 (419) 315-7481, Personal website: mostafa-mr.com

Mostafa's LinkedIn Recommendation:
Alireza and I have co-authored 28 publications since 2010. Working with Alireza is both enjoyable and fruitful. As a researcher, he is very thorough, hardworking, and reliable. His teamwork spirit is unique and I always look forward to doing more together. Recently, I've been teaching Alireza Python and machine learning algorithms. Our goal is to collaborate on some deep-learning projects in the near future.

**PhD in Physics & Data Scientist** | since 2020 | Hamid Shojaei, Ph.D., Senior Data Scientist consultant at Excelacom, USA.
Email: hshojaei@exclacom.com, Tel: +1 (413) 695 0460

Hamid's LinkedIn Recommendation:
Over the past two years, Alireza has sought my guidance on machine learning several times. He has in-depth knowledge and skill in mathematics and programming, and it is easy to recognize his eagerness to learn and his skill in coding and mathematics. He has a solid research background and scientific analysis, and I look forward to collaborating with him on future projects.