## Amir Rezaei, PhD

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## PROFESSIONAL SUMMARY

A **CAE engineer** and **research expert** with extensive experience in *applied mechanics research* and *computer-aided engineering*. A team-oriented professional who is highly *communicative*, enjoys *problem solving*, and *works cross-functionally*. Capable of performing a wide variety of *FEA simulations, structural analysis, and concept design*.

## PROFESSIONAL SKILLS AND INTERESTS

- **NVH simulation**
- **Durability simulation**
- **Programming**
- **CAD & concept design**
- **Documentation & reporting**
- **Problem solving**

*Other relevant skills:*

**Computer Skills:** ABAQUS, ANSA, ANSYS, Autodesk Inventor, HyperWorks, MATLAB, Python, Solidworks
**Additional Languages:** English (advanced), Farsi (native), Italian (basic)

## PROFESSIONAL SKILLS DEMONSTRATED

Sapienza University of Rome
June 2021 – Present
**R&D Engineer**
Contributes to the development of payload concept design for the third-generation gravitational wave detector in *Amaldi Research Center*, working with partners in EGO-gw and KAGRA.

- **NVH simulation:** Performing various NVH analyzes (modal, random response, response spectrum, etc.) in virtual domains (ABAQUS & ANSYS Workbench) to set targets for vibration behavior of payload models while accounting for nonlinearity and thermal loading; followed by collaboration with lab to validate post-processing results through experimentation.
- **Durability simulation:** Performing durability analyzes (creep, strength, structural integrity under seismic loading, etc.) on payload components such as suspension wires, test masses, and interface parts using *ANSA* & *ABAQUS* to determine the performance and potential failure modes.
- **Programming:** Running the MATLAB optimization algorithm (fmincon) in parallel with an ABAQUS thermomechanical simulation to determine a lower threshold for mechanical properties of the marionette wire in terms of strength and conductivity.
- **CAD & concept design:** Producing alternative CAD concepts and optimizing the existing models for intricate payload sub-assemblies such as marionette, platforms, and actuation cages based on broad written or verbal specifications from the project leader using *Autodesk Inventor*; followed by creating drawings in compliance with departmental and discipline standards.

Hezar Aluminum industries
April 2013 – September 2013
**Internship**
Studying various types of metal forming processes including rolling, extrusion and casting as well as predicting residual stresses in materials processed by such processes using *ANSYS*.

## EDUCATION

**Doctor of Philosophy (PhD) in *Theoretical and Applied Mechanics*.** Sapienza University of Rome (Rome, Italy)

**Master of Science (MSc) in *Applied Mechanics*.** Shahid Bahonar University of Kerman (Kerman, Iran)

*Additional Professional Development:*

- Design for Manufacturing (Cert. UC-201028cd-5924-4b7b-8005-8ed1931cc602) – Udemy (2021)
- Material Selection for Mechanical Design (Cert. Cert. UC-5ec41893-54ab-4009-a35a-a0b999d4bf7e) – Udemy (2021)
- ABAQUS CAE (Cert. UC-a96590c8-5a97-495e-99d2-0c09e2d1f70b) – Udemy (2021)
- ANSA (Cert. UC-b6d712a8-8de2-4b1d-a985-e621c00372b9) – Udemy (2022)

## EXTRACURRICULAR ACTIVITIES

**Globetrotting:** Getting to know interesting people, reaching a better understanding of myself, and indeed expanded horizons are what frequent travels across the globe has offered me; and that is why it is my top pick hobby.

**Volunteerism:** I have always been attracted to fundraising campaigns for charitable purposes since it brings peace of mind to me. I welcome any chance in my leisure time to participate in such causes as in the past.

**Photography:** Everybody likes to freeze moments of life that carry certain emotions and meanings to them though it is impossible. However, photography gives me the tool to get a taste of those moments to a certain degree.

## Publications

- **Rezaei, A. S.**, & Saidi, A. R. (2015). Exact solution for free vibration of thick rectangular plates made of porous materials. *Composite Structures*, *134*, 1051-1060.
- **Rezaei, A. S.**, & Saidi, A. R. (2016). Application of Carrera Unified Formulation to study the effect of porosity on natural frequencies of thick porous–cellular plates. *Composites Part B: Engineering*, *91*, 361-370.
- **Rezaei, A. S.**, & Saidi, A. R. (2017). On the effect of coupled solid-fluid deformation on natural frequencies of fluid saturated porous plates. *European Journal of Mechanics-A/Solids*, *63*, 99-109.
- Askari, M., Saidi, A. R., & **Rezaei, A. S.** (2017). On natural frequencies of Levy-type thick porous-cellular plates surrounded by piezoelectric layers. *Composite Structures*, *179*, 340-354.
- **Rezaei, A. S.**, & Saidi, A. R. (2017). Buckling response of moderately thick fluid-infiltrated porous annular sector plates. *Acta Mechanica*, *228*(11), 3929-3945.
- **Rezaei, A. S.**, Saidi, A. R., Abrishamdari, M., & Mohammadi, M. P. (2017). Natural frequencies of functionally graded plates with porosities via a simple four variable plate theory: an analytical approach. *Thin-Walled Structures*, *120*, 366-377.
- Coppo, F., **Rezaei, A. S.**, Mezzani, F., Pensalfini, S., & Carcaterra, A. (2018). Waves path in an elastic membrane with selective nonlocality. In *Proceedings of ISMA*.
- **Rezaei, A. S.**, & Saidi, A. R. (2018). An analytical study on the free vibration of moderately thick fluid-infiltrated porous annular sector plates. *Journal of Vibration and Control*, *24*(18), 4130-4144.
- **Rezaei, A. S.**, Mezzani, F., & Carcaterra, A. (2019). Memory Effects in Wave Propagation. In *Proceedings of International Congress on Sound and Vibration*.
- Mezzani, F., **Rezaei, A. S.**, & Carcaterra, A. (2020). Wave propagation phenomena in nonlinear elastic metamaterials. In *New Trends in Nonlinear Dynamics* (pp. 31-40). Springer, Cham.
- **Rezaei, A. S.**, Mezzani, F., & Carcaterra, A. (2020). Waves in long-range connected waveguide: single and multiple interaction regions. In *Proceedings of ISMA*.
- **Rezaei, A. S.**, Sorokin, S. V., Mezzani, F., & Carcaterra, A. (2020). Band structure of elastic bodies with periodic nonlocalities. In *Proceedings of International Conference on Structural Dynamics, EURODYN 2020* (pp. 2457-2463).
- Askari, M., Saidi, A. R., & **Rezaei, A. S.** (2020). An investigation over the effect of piezoelectricity and porosity distribution on natural frequencies of porous smart plates. *Journal of Sandwich Structures & Materials*, *22*(7), 2091-2124.

☐ Rad, E. S., Saidi, A. R., **Rezaei, A. S.**, & Askari, M. (2020). Shear deformation theories for elastic buckling of fluid-infiltrated porous plates: an analytical approach. *Composite Structures*, *254*, 112829.

☐ **Rezaei, A. S.**, Mezzani, F., & Carcaterra, A. (2021). Wave propagation with long-range forces and mistuning effects. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, *235*(14), 2622-2628.

☐ **Rezaei, A. S.**, Carcaterra, A., Sorokin, S. V., Hvatov, A., & Mezzani, F. (2021). Propagation of waves in nonlocal-periodic systems. *Journal of Sound and Vibration*, *506*, 116156.

☐ Gughari, M. S., Saidi, A. R., **Rezaei, A. S.**, Askari, M., & Naderi, A. (2022). Analytical buckling response of sectorial porous plates integrated with piezoelectric layers. *Applied Mathematical Modelling*, *101*, 811-831.

☐ **Rezaei, A. S.**, Mezzani, F., & Carcaterra, A. (2022). Long-Range Resonator-Based Metamaterials. In *Advances in Nonlinear Dynamics* (pp. 431-440). Springer, Cham.

☐ Di Pace, S., Mangano, V., Pierini, L., **Rezaei, A. S.**, Hennig, J. S., Hennig, M., ... & Van Heijningen, J. (2022). Research Facilities for Europe's Next Generation Gravitational-Wave Detector Einstein Telescope. *Galaxies*, *10*(3), 65.