MIT Career Advising & Professional Development

Sample Resumes
PhD II Resume

Mechanical Engineer

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SUMMARY

Extensive experience with applying analytical and numerical methods (such as the finite element method) to model a broad range of systems from molecular structures to large-scale mechanical structures. Proven track record of creating and improving new computational methods to perform dynamic and static analysis of otherwise intractable engineering and biological systems. Strong ability to collaborate and work in a team environment on multi-disciplinary projects. Legally authorized to work in the United States (Green Card holder).

EDUCATION

Massachusetts Institute of Technology (MIT), Cambridge, MA, USA   20XX
Ph.D., Department of Mechanical Engineering.
- Thesis: "Contributions to the analysis of proteins" under the supervision of Prof. Jones and Prof. Smith
- GPA: 5.0/5.0 (Awarded an A+ grade for all courses. Only one or two people in each course get A+.)

Sharif University of Technology, Tehran, IRAN   20XX
M.Sc., Department of Mechanical Engineering.
Thesis: "Online control of needle injection into soft tissue using the finite element method"
- GPA: 18.62/20.0 (Ranked in top 5%)

University of Tehran, Tehran, IRAN   20XX
B.Sc., Department of Mechanical Engineering.
- GPA: 17.68/20.0 (Class Rank: 2)

SKILLS

- **Computer**: Commercial finite element software programs: ADINA (founded and owned by my Ph.D. and postdoctoral advisor, Prof. KJ Bathe), ABAQUS, ANSYS; MeshLab (a mesh processing program); MATLAB; Fortran; AutoCAD; molecular viewers: PyMOL, VMD, UCSF Chimera; CHARMM (a molecular dynamics program); Adobe Illustrator.
- **Analytical**: Finite element method; optimization; stochastic simulation: Langevin and Brownian dynamics simulation; statistical analysis; multi-scale modeling; atomistic modeling; continuum modeling; bioinformatics; biomechanics; computational biology; molecular biology; biophysics; solid mechanics; fluid mechanics; controls.
- **Language**: English (fluent); Persian (native); Arabic (basic).

EXPERIENCE

Department of Mechanical Engineering, MIT, Cambridge, MA, USA   Oct. 20XX–current
Postdoctoral Associate
- Led project team that developed a coarse-grained finite element framework for the Brownian dynamics of macromolecular proteins that are inaccessible to available molecular dynamics algorithms.
- Created a model to calculate the diffusion coefficients and Brownian dynamics of DNA origami structures as part of a project in collaboration with researchers from MIT, Harvard, University of Michigan, Arizona State University, and Max Planck Institute. No other models are currently available.
- Member of team that developed a coarse-grained three-dimensional hydrodynamic model of semi-flexible filaments that resulted in several orders-of-magnitude reduction in computational cost.
- Collaborated with other engineers to improve a well-known implicit time-integration scheme that is widely used in engineering problems and in numerous commercial software tools. The improved version of the scheme has already been implemented in ADINA.

Department of Mechanical Engineering, MIT, Cambridge, MA, USA   Jan. 20XX–Jun. 20XX
Research Assistant
- Improved a widely used eigenvalue solver to substantially reduce the computational cost of calculating the eigen-solutions of large-scale engineering and bioengineering systems. The improved version of the eigenvalue solver is currently used in ADINA.
- Made novel discoveries into the shape and function of complex proteins, the results of which have been included in comprehensive government and research databases (such as the Protein Data Bank) and utilized by leading research companies.
- Developed a coarse-grained finite element framework for the diffusion coefficients of proteins.

Department of Mechanical Engineering, MIT, Cambridge, MA, USA   Fall 20XX, Fall 20XX, Fall 20XX
Teaching Assistant, "Finite Element Analysis of Solids and Fluids I" & "Mechanics and Materials I"
- Prepared and presented lectures and recitations, supported term projects, helped students with course materials, and graded homework

Department of Mechanical and Aerospace Engineering, Ohio State University, Columbus, OH, USA   Fall 20XX
Teaching Assistant, "Thermodynamics I"
- Contributed to designing experiments for a new thermodynamics laboratory.

ITCEN Co. (Industrial & Technical Consulting Engineers Company), Tehran, IRAN   Mar. 20XX–Sept. 20XX
Senior Engineer
- Designed the layout of production lines for a pipe manufacturer.

Department of Mechanical Engineering, Sharif University of Technology, Tehran, IRAN   Sept. 20XX–Dec. 20XX
Research Assistant
- Performed compression tests on bovine liver and characterized its material properties using the genetic algorithm and the finite element method. Developed an algorithm to obtain the optimal path initiation for the needle insertion into bovine liver for biopsy and brachytherapy purposes.

SAPCO Co. (Supplying Automotive Parts Company), Tehran, IRAN   Summer 20XX; Summer 20XX
Intern
- Analyzed newly designed and produced automotive parts using mechanical tests such as Engine Test, Material Strength Test, etc.

HONORS AND AWARDS

MIT Outstanding Graduate Student Institute Award (20XX). This award was given to the top two graduate students at the Department of Mechanical Engineering at MIT. The department has more than 500 graduate students; **NSF Fellowship for the GEM4-2010 program** (20XX); **Highly Distinguished Student of University of Tehran** (19XX–20XX): A student who is in top 0.05% (out of ~500,000 applicants) in the nation-wide university entrance exam and his/her semester GPAs are above 17 out of 20.

JOURNAL PUBLICATIONS

Mech Eng et al., "Three-dimensional implicit hydrodynamic model of semi-flexible filaments", in preparation.

Mech Eng et al., "Diffusion coefficients of DNA origami structures", in preparation.

Mech Eng et al., "Brownian dynamics simulation of DNA origami structures", in preparation.

Mech Eng et al., "A finite element framework for Brownian dynamics simulation of proteins", in preparation.

Mech Eng, A. A. Fedorov, E. V. Fedorov, S. Ono, F. Matsumura, S. C. Almo, & M. Bathe, "Structure, evolutionary conservation, and conformational dynamics of Homo sapiens fascin-1, an F-actin crosslinking protein", Journal of Molecular Biology, 400 (20XX), pp. 589-604.

Mech Eng, M. T. Ahmadian, & F. Janabi-Sharifi, "Modeling, simulation, and optimal initiation planning for needle insertion into the liver", Journal of Biomechanical Engineering-Transactions of the ASME, 132 (20XX), p. 041001 (11 pages).

Mech Eng, M. Bathe, & K. J. Bathe, "The subspace iteration method in protein normal mode analysis", Journal of Computational Chemistry, 31 (20XX), pp. 66-74.

M. T. Ahmadian, **Mech Eng**, & R. Abdollahpour, "A nonlinear viscoelastic modeling of brain and CSF deformation under tumor expansion", International Journal of Scientific Research, 16 (20XX), pp. 425-428.

M. T. Ahmadian, **Mech Eng** R. Abdollahpour, S. Sharifi Sedeh, & K. Navi, "Application of car active suspension in vertical acceleration reduction of vehicle due to road excitation and its effect on human health", International Journal of Scientific Research, 16 (20XX), pp. 429-434.

M. T. Ahmadian, R. Abdollahpour, & **Mech Eng**, "Effect of tumor location and its growth on stress distribution in the brain", International Journal of Scientific Research, 16 (20XX), pp. 523-527.

OTHER PUBLICATIONS

3 first-author journal abstracts; 14 conference papers.

ACTIVITIES

- Sports: Soccer; table tennis; swimming; hiking; mountain climbing.
- Music: Singing.