

Curriculum Vitae/Resume

Erol Aksoy

Istanbul Technical University Maslak Campus,
Faculty of Aeronautics and Astronautics, HEMLAB
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EDUCATION *Bachelor of Aeronautical Engineering, GPA - 3.81* 2017 - 2021
Istanbul Technical University, Istanbul, Turkey.
M.Sc. in Aeronautical and Astronautical Engineering, GPA - 4.00 2021 - 2024
Istanbul Technical University, Istanbul, Turkey.

INTEREST *Aerodynamics, Computational Aerodynamics, Fluid Mechanics, Computational Fluid Dynamics*

WORKING EXPERIENCE *Research/Teaching Assistant* November, 2022 - Current date
Istanbul Technical University,
Aeronautical Engineering Department,
Istanbul, Turkey.

BAYKAR - Internship in CFD Analysis Team June - August, 2019
Istanbul, Turkey.

- • CFD Analysis of bombs and missiles carried on the UAVs
- • Softwares: ANSYS (CFX + Mesh Generator), XFLR5

TEACHING EXPERIENCE *Teaching Assistant:*

- • Aerodynamics (undergrad)
- • Thermodynamics (undergrad)
- • Numerical Methods (undergrad)
- • Intro. to Partial Differential Equations (undergrad)
- • Engineering Mathematics (grad)

TECHNOLOGY SKILLS *Programming Languages:* Fortran, C, C++, Python, Julia, Visual Basic + Excel VBA, Matlab.

Softwares and Libraries: Stanford University Unstructured(SU2), ANSYS(CFX + Mesh Generator), ANSYS Static Structural, Pointwise, XFOIL, XFLR5, DATCOM, OpenVSP, Visual Studio, Latex, Microsoft Office Programs.

Operating Systems: Windows, Linux.

PUBLICATIONS • Aksoy, E., & Sahin, M. (2023). *HEMLAB ALE: A New ALE Algorithm for Compressible Flow Problems, II ECCOMAS Thematic Conference on Multidisciplinary Design Optimization of Aerospace Systems*, July 19-21, 2023, Lisbon, Portugal.

• Aksoy, E., Sahin, M. (2023). *HEMLAB ALE Algorithm Applied to Solve Flow Around S-76 Main Rotor*, XII. Ankara International Aerospace Conference, Sep 2023, Ankara/Turkey

• Aksoy, E., & Sahin, M. (2022). *An Application of Anisotropic Mesh Refinement to Solve Flow Around the S-76 Main Rotor with Swept-Tapered Tip*, AIAA SciTech 2022 Forum (p. 1319).

• Aksoy, E., Sahin, M. (2021). *The Numerical Solution of Flow Field Around S76 Rotor*, XI. Ankara International Aerospace Conference, Sep 2021, Ankara.

• Aksoy, E., Karali, H. & Yükselen, M. A. (2020). *Kanat Profilleri için Doğrusal Olmayan Aerodinamik Performans Görselleştirmesi ve İHA Analiz Programı ile Entegrasyonu*, VIII. Ulusal Havacılık ve Uzay Konferansı, Eylül 2020, Ankara.

PROJECTS

Master Project: Implementation of an ALE algorithm to solve moving mesh problems for HEMLAB compressible solver (with Prof. Dr. Mehmet Sahin) - **Undergoing**

- • The project is supported by **The Scientific and Technological Research Council of Turkey**.
- • An Arbitrary Lagrangian-Eulerian (ALE) algorithm is being implemented into an existing software HEMLAB code.
- • I have had to deal with vast majority of numerical techniques from limiter functions, interpolations, gradient computing to entropy corrections and numerical schemes besides the ALE algorithm.
- • Softwares and Languages : HEMLAB Solver, Fortran90, Linux

Undergrad. Graduation Project: The Numerical Solution of Flow Field around S76 Rotor (with Prof. Dr. Mehmet Sahin) - **Completed**

- • An application of anisotropic mesh refinement technique of an open source library to solve the flow-field around S-76 main rotor.
- • This study is conducted on the clusters provided by National Center of High Performance Computing of Turkey (UHeM).
- • Softwares and Languages : SU2, Pointwise, pyAMG library, Linux, python

UAV Analysis Tool: Nonlinear performance visualization for airfoils and Integration with UAV analysis tool (with Prof. Dr. M. Adil Yükselen and Res. Asist. Hasan Karali) - **Completed**

- • An interface was prepared for XFOIL tool and integrated with a 3D nonlinear Aerodynamic analysis tool.

- • 3D Nonlinear Analysis tool was extended to solve simple wing-tail-fuselage configurations.
- • Softwares : XFOIL, Visual Basic, Visual Studio.

INDIVIDUAL CURRICULAR STUDIES

- Computational Fluid Dynamics :
 - A Parallel Poisson Equation Solver. This study includes parallelization with virtual-topologies and MPI-derived data types assuring that the alignment of processor communications conforms with the alignment of data in RAM. Block-compressed sparse matrix-vector allocations are exploited.
 - 2D Cell-centered Finite Volume Algorithm to solve Euler Equations. The algorithm was second order accurate with Venkatakrishnan limiter. It can work on unstructured quad mesh elements.
 - A second order Finite Element algorithm to solve Stokes and Laplace equations was written in Fortran90. The algorithm works on Q2-Q1 elements.
 - Softwares and Languages: Fortran, MUMPS Library.
- Parallel Programming :
 - Softwares and Languages: C, C++, Fortran, OpenMPI, OpenMP.
 - Based on Parallel and Distributed Computing course
- Osculating Cone Methodology (not completed) :
 - Osculating Cone Methodology was tried to be applied for designing Hypersonic Waverider Geometries.
 - Language : Matlab
- 2D and 3D Potential Aerodynamics Analysis Codes :
 - Classical Thin Airfoil Theory and Lumped Vortex Approach were applied.
 - Classical Prandtl's Lifting Line Theory and its Nonlinear applications were done.
 - Language : Excel VBA, python.

AWARDS

/FELLOWSHIPS

National MSc/MA Scholarship Program

2021 - 2023

The Scientific and Technological Research Council of Turkey
Ankara, Turkey.

Summer of HPC - PRACE

July - Aug. (2 Months) 2022

Partnership for Advanced Computing in Europe
Paris, France.

HOBBIES

Individual Interests

- Playing baglama, kamancha(kabak kemane), Tar

Professional Interest

- Swimming

REFERENCES

Prof. Dr. M. Adil Yukselen - Istanbul Gelisim University, Aeronautical Engineering

- E-mail : yukselen@itu.edu.tr

Prof. Dr. Mehmet Sahin - Istanbul Technical University, Astronautical Engineering

- E-mail : msahin@itu.edu.tr

Assoc. Prof. Bayram Celik - Istanbul Technical University, Astronautical Engineering

- E-mail : celikbay@itu.edu.tr