Hasan U. Akay, PhD
Professor and Chair
Departments of Automotive and Mechanical Engineering
Atilim University
Ankara, Türkiye
hasan.akay@atilim.edu.tr
Tel: +90 312 586 8963

Revision Date: 23-07-2025

EDUCATION

1969-1974	The University of Texas at Austin, Texas, USA, Computational Structural Mechanics, PhD.
1967-1969	The University of Texas at Austin, Texas, USA, Computational Structural Mechanics, MS.
1963-1967	Middle East Technical University, Ankara, Turkey, Civil Engineering, BS.

ACADEMIC POSITIONS

Mar 2010 – Present	Professor, Department of Mechanical Engineering, Atilim University, Turkey.
Apr 2003 – Mar 2010	Chancellor's Professor, Department of Mechanical Engineering, Indiana University-Purdue University Indianapolis (IUPUI), Indiana, USA.
May 1985 – Apr 2003	Professor, Department of Mechanical Engineering, Indiana University-Purdue University Indianapolis (IUPUI), Indiana, USA.
Nov 1979 – May 1985	Associate Professor, Department of Mechanical Engineering, Indiana University-Purdue University Indianapolis (IUPUI), Indiana, USA.
May 1979 – Nov 1979	Associate Professor, Department of Civil Engineering, Middle East Technical University (METU), Ankara, Turkey.
Sep 1974 – May 1979	Assistant Professor, Department of Civil Engineering, Middle East Technical University (METU), Ankara, Turkey.

ADMINISTRATIVE DUTIES

July 2025 – Present	Chair (A), Department of Mechanical Engineering, Atilim University, Ankara, Turkey
Nov 2018 – Present	Chair, Department of Automotive Engineering, Atilim University, Ankara, Turkey.
July 2020 – July 2022	Chair (A, Department of Civil Engineering, Atilim University, Ankara, Turkey.
Sep 2017 – July 2018	Director of Research and Technology Transfer, Atilim University, Ankara, Turkey.
Mar 2010 – July 2017	Provost (Vice Rector), Atilim University, Ankara, Turkey.
Sep 2009 – Jan 2010	Associate Dean for Academic Affairs and Research, School of Engineering and Technology, Indiana University-Purdue University Indianapolis (IUPUI), Indiana, USA.
Sep 2000 – Aug 2009	Chair, Department of Mechanical Engineering, Indiana University-Purdue University Indianapolis (IUPUI), Indiana, USA.
Sep 1976 – Nov 1979	Associate Chair, Department of Civil Engineering, Middle East Technical University, Ankara, Turkey.

HONORS&AWARDS

1	Center for Research and Learning Director's Award for Distinguished Mentor, IUPUI, 2007.
2	Fellow, American Society of Mechanical Engineers (ASME), 2004-Present.
3	Chancellor's Professor of Mechanical Engineering, IUPUI, 2003-2010.
4	Member, Alliance of Indiana University Distinguished and Titled Professors, 2003-2010.
5	Dorris H. Merritt Outstanding Leadership Award, School of Engineering and Technology, IUPUI, 2002.
6	The School of Engineering and Technology Dean's Special Award for Distinguished Contributions to the School, IUPUI, 1999.
7	TERA Teaching Excellence Recognition Award, IUPUI, 1997.
8	Abe Max Distinguished Professor Award for Research, School of Engineering and Technology, 1993.
9	NATO Scholarship of The Scientific and Technical Research Council of Turkey (to study PhD at The University of Texas at Austin), 1971-1973.
10	Fulbright-Hays Scholarship of U.S. State Department (to study Master's at The University of Texas at Austin), 1967-1968.

RESEARCH INTERESTS

1	Computational Mechanics
2	Computational Fluid Dynamics
3	Computational Solid Dynamics
4	High Performance Parallel Computing
5	Finite Element and Finite Volume Methods
6	Multidisciplinary Topology and Shape Optimizations

PROFESSIONAL SERVICE

1	Associate Editor, International Journal of Computational Fluid Dynamics, 1990-Present
2	Technical Consultant, EDA Engineering and Design Ltd., 2004-Present
3	Member of Board of Directors, Ostim Teknopark, Ankara, Turkey, 2015-2021
4	Technical Consultant, Technalysis, Inc., Indianapolis, IN, 1985-2010
5	Technical Consultant, Allison Transmission Company, Indianapolis, IN, 1983-1985

JOURNAL PUBLICATIONS

1	N. Şener, H.U. Akay, Ş. Yiğit, "A Gradient-Enhanced Efficient Global Optimization Driven Aerodynamic Shape Optimization Framework." *Aerospace*, Vol. 12, No. 7, 2025. 10.3390/aerospace12070644.
2	C. Kulak, H.U. Akay, "CFD Coupled Structural Topology Optimization For Aircraft Wings," *Journal of Aeronautics and Space Technologies*, 2025 (*in press*).
3	S. Abuhanieh, H. U. Akay, "Numerical Investigation of Store Separation from Cavity Problems, Proceedings of the Institution of Mechanical Engineers, Part G: *Journal of Aerospace Engineering*, Sep, 2023. https://doi.org/10.1177/09544100231203404,
4	M. Omair, H.U. Akay, "Improved Simulation of Cryogenic Fluid Mixing at Supercritical Pressures," *PloS One*, vol. 18(1):e0277711, Jan, 2023. https://doi.org/10.1371/journal.pone.0277711,
5	S. Abuhanieh, H.U. Akay, B. Biçer, "A New Strategy for Solving Store Separation Problems Using OpenFOAM," Proceedings of the Institution of Mechanical Engineers, Part G: *Journal of Aerospace Engineering*, Vol. 136, Issue 15, 2022. https://doi.org/10.1177/09544100221080771,
6	S. Edeeb, H.U. Akay, S. Ozgen, Prediction of Ice Accretion Shapes On Aircraft Wings Using Open-Source Software, *ARPN Journal of Engineering and Applied Sciences*, Vol. 16, No. 20, 2021. http://www.arpnjournals.com/jeas/volume_20_2021.htm.
7	H.U. Akay, E. Oktay, M. Manguoglu, A.A. Sivas, "Improved Parallel Preconditioners for Multidisciplinary Topology Optimizations," *International Journal of Computational Fluid Dynamics*, Vol. 30, pp. 333-336, 2016. https://doi.org/10.1080/10618562.2016.1205737
8	E. Oktay, H.U. Akay, O.T. Sehitoglu, "Three-Dimensional Structural Topology Optimization of Aerial Vehicles Under Aerodynamic Loads," *Computers and Fluids*, Vol. 92, pp. 225-232, 2014. http://dx.doi.org/10.1016/j.compfluid.2013.11.018.
9	E. Oktay, H.U. Akay, and O. Merttopcuoglu, "Parallelized Structural Topology Optimization and CFD Coupling for Design of Aircraft Wing Structures," *Computers and Fluids*, Vol. 49, pp. 141-145, 2011. https://doi.org/10.1016/j.compfluid.2011.05.005.
10	J. Liu, H.U. Akay, A. Ecer, and R.U. Payli, "Flow Around Moving Bodies Using a Dynamic Unstructured Overset-grid Method," *Int. J. Computational Fluid Dynamics*, Vol. 24, No. 6, pp. 187-200, 2010. https://doi.org/10.1080/10618562.2010.521130.
11	N. Nayan, H.U. Akay, M.R. Walsh. W.V. Bell, G.L. Troyer, R.E. Dukes, and P. Mohan, "CFD Modeling of Pharmaceutical Isolators with Experimental Verification of Airflow," *PDA J. Pharmaceutical Science and Technology*, pp. 237-254, 2007. https://pubmed.ncbi.nlm.nih.gov/17933207/.
	J. Koh, A.T. Hsu, H.U. Akay, and M.F. Liou, "Analysis of Overall Heat Balance in Self-Heated Proton-Exchange-Membrane Fuel Cells for Temperature Predictions," *Journal of Power Sources*, No. 144, pp. 122-128, 2005. https://doi.org/10.1016/j.jpowsour.2004.12.055.

12	M.J. Pikal, S. Cardoni, C. Bhugra, F. Jameel, S. Rambhatla, W.J. Mascarenhas, H.U. Akay, "The Nonsteady State Modeling of Freeze Drying: In-Process Product Temperature and Moisture Content Mapping and Pharmaceutical Product Quality Applications," *Pharmaceutical Development and Technology*, Vol. 10, No. 1, pp. 17-32, 2005. https://doi.org/10.1081/pdt-35869.
13	
14	R.M. Pidaparti, P.W. Longest, A.T. Hsu, and H.U. Akay, "Nanoscale Computational Analysis for an Idealized Bio-molecular Motor," *Bulletin of the Polish Academy of Sciences, Technical Sciences*, Vol. 53, No. 4, 2005.
15	E. Oktay, H.U. Akay, and A. Uzun, "A Parallelized 3D Unstructured Euler Solver for Unsteady Aerodynamics," *AIAA Journal of Aircraft,* Vol. 40, No. 2, pp. 348-354, 2003. https://doi.org/10.2514/2.3099
16	H.U. Akay, Y. Liu, and M. Rassaian, "Simplification of Finite Element Models for Thermal Fatigue Life Prediction of PBGA Packages," *ASME Journal of Electronic Packaging*, Vol. 125, pp. 347-353, 2003. https://doi.org/10.1115/1.1569956.
17	E. Yilmaz, M.S. Kavsaoglu, H.U. Akay, and I.S. Akmandor, "Cell-vertex Based Parallel and Adaptive Explicit 3D Flow Solution on Unstructured Grids," *International Journal of Computational Fluid Dynamics*, Vol. 14, pp. 271-286, 2001. https://doi.org/10.1080/10618560108940729.
18	Y.P. Chien, A. Ecer, H.U. Akay, S. Secer, and J.D. Chen, "Cost Estimation for Parallel CFD Using Variable Time-Stepping Algorithms," *International Journal of Computational Fluid Dynamics*, Vol. 15, pp. 183-195, 2001. https://doi.org/10.1080/10618560108970028.
19	S. Kocak and H.U. Akay, "Parallel Schur Complement Method for Large-Scale Systems on Distributed Memory Computers, *Journal of Applied Mathematical Modeling*, Vol. 25, pp. 873-886, 2001. https://doi.org/10.1016/S0307-904X(01)00019-1.
20	Y.P. Chien, A. Ecer, H.U. Akay, S. Secer, and R. Blech, "Communication Cost Estimation for Parallel CFD Using Variable Time-Stepping Algorithms," *Computer Methods in Applied Mechanics and Engineering*, Vol. 19, pp. 1379-1389, 2000. https://doi.org/10.1016/S0307-904X(01)00019-1
21	A. Ecer, N. Gopalaswamy, H.U. Akay, and Y.P. Chien, "Digital Filtering Techniques for Parallel Computation of Explicit Schemes," *International Journal of Computational Fluid Dynamics*, Vol. 13, pp. 211-222, 2000. https://doi.org/10.1080/10618560008940899.
22	H.U. Akay, A. Ecer, and K. Fekete, "A Semi-Explicit Parallel Solver for Viscous Incompressible Flows," *Computer Methods in Applied Mechanics and Engineering*, Vol. 151, pp. 1-12, 1998. https://doi.org/10.1016/S0045-7825(97)00110-2.
23	N. Gopalaswamy, A. Ecer, H.U. Akay, and Y.P. Chien, "Efficient Parallel Communication Schemes for Explicit CFD Solvers," *AIAA Journal*, Vol. 36, No.6, pp. 961-967, 1998. https://doi.org/10.2514/2.465.
24	H.U. Akay, N.H. Paydar, G. Glogas, and H. Zhang, "Viscoelastic Study of a Conductive Adhesive for Electronic Packages – Part 1: Experimental Determination of Material Properties," *International Journal of Microelectronic Packaging*, Vol. 1, pp. 217-224, 1998.
25	H.U. Akay, N.H. Paydar, G. Glogas, and H. Zhang, "Viscoelastic Study of a Conductive Adhesive for Electronic Packages – Part 2: Thermal Stress Analysis Using the Finite Element Method," *International Journal of Microelectronic*

	Packaging, Vol. 1, pp. 225- 233, 1998.
26	H.U. Akay, N.H. Paydar, A. Bilgic, "Fatigue Life Predictions for Thermally Loaded Solder Joints Using a Volume-Weighted Averaging Technique," *ASME Journal of Electronic Packaging*, Vol. 119, pp. 228-235, 1997. https://doi.org/10.1115/1.2792241.
27	N. Gopalaswamy, H.U. Akay, A. Ecer, and Y.P. Chien, "Parallelization and Dynamic Load Balancing of NPARC Codes," *AIAA Journal*, Vol. 35, 1997, pp. 1806-1812. https://doi.org/10.2514/2.55.
28	W.J. Mascarenhas, H.U. Akay, and M.J. Pikal, "A Computational Model for Finite Element Analysis of the Freeze-Drying Process," *Computer Methods in Applied Mechanics and Engineering*, Vol. 148, 1997, pp. 105-124. https://doi.org/10.1016/S0045-7825(96)00078-3
29	B.K. Karamete, H.U. Akay, T. Tokdemir, and M. Ger, "A Simple Unstructured Tetrahedral Mesh Generation Algorithm for Complex Geometries," *Mathematical and Computer Modeling*, Vol. 24, No. 10, 1996, pp. 97-102. https://doi.org/10.1016/S0895-7177(96)00168-9
30	H.U. Akay and A. Ecer, "Parallel Computation of Unsteady Flows on Network of Workstations," *International Journal of Computational Fluid Dynamics,* Vol. 7, 1996, pp. 15-21. https://doi.org/10.1080/10618569608940750.
31	H. Huang, O. Gurdogan, H.U. Akay, and W.W. Fincher, "Thermal Transport Phenomena in Metal Casting Simulations," *AFS Transactions*, Vol. 103, 1995, pp. 243-252.
32	T.R. Katona, N.H. Paydar, H.U. Akay, and W.E. Roberts, "Stress Analysis of Bone Modeling Response to Rat Molar Orthodontics," *Journal of Biomechanics*, Vol. 28, 1995, pp. 27-38. https://doi.org/10.1177/10454411970080010501
33	Y.P. Chien, F. Carpenter, A. Ecer, and H.U. Akay, "Load Balancing for Parallel Computation of Fluid Dynamics Problems", *Computer Methods in Applied Mechanics and Engineering*, Vol. 120, 1995, pp. 119-130. https://doi.org/10.1016/0045-7825(94)00048-R
34	N. Paydar, Y. Tong, and H.U. Akay, "A Finite Element Study of Factors Affecting Fatigue Life of Solder Joints," *ASME Journal of Electronic Packaging*, Vol. 116, 1994, pp. 265-273. https://doi.org/10.1115/1.2905697.
35	L.G. Reifschneider and H.U. Akay, "Applications of a Fiber Orientation Prediction Algorithm for Compression Molded Parts with Multiple Charges," *Polymer Composites,* Vol. 15, No. 4, August 1994, pp. 261-269. https://doi.org/10.1002/pc.750150404.
36	F. Ladeinde and H.U. Akay, "The Calculation of Scalar Transport During the Injection Molding of Thermoset Polymers," *Applied Mathematical Modeling,* Vol. 18, June 1994, pp. 347-357. https://core.ac.uk/download/pdf/82052514.pdf.
37	J. Chen, X. Lu, N. Paydar, H.U. Akay, and W.E. Roberts, "Mechanical Simulation of the Human Mandible with and without and Endessous Implant," *Medical Engineering Physics,* Vol. 16, January 1994, pp. 53-61. https://doi.org/10.1016/1350-4533(94)90011-6.
38	Y.P. Chien, A. Ecer, H.U. Akay, F. Carpenter, and R.A. Blech, "Dynamic Load Balancing on a Network of Workstations for Solving Computational Fluid Dynamics Problems," *Computer Methods in Applied Mechanics and Engineering*, Vol. 119, 1994, pp. 17-33. https://doi.org/10.1016/0045-7825(94)00074-3.
39	M.P. Reddy, L.G. Reifschneider, J.N. Reddy, and H.U. Akay, "Accuracy and Convergence of Element-By-Element Iterative Solvers for Incompressible Fluid Flows Using Penalty Finite Element Model," *International Journal for Numerical*

	Methods in Fluids, Vol. 17, 1993, pp. 1019-1033. https://doi.org/10.1002/fld.1650171202.
40	A. Ecer, H.U. Akay, W.B. Kemle, H. Wang, D. Ercoskun, and E.J. Hall, "Parallel Computation of Fluid Dynamics Problems," *Computer Methods in Applied Mechanics and Engineering*, Vol. 112, 1994, pp. 91-108. https://doi.org/10.1016/0045-7825(94)90020-5.
41	H.U. Akay, Y. Tong, and N. Paydar, "Thermal Fatigue Analysis of an SMT Solder Joint Using Nonlinear FEM Approach," *International Journal of Microcircuits and Electronic Packaging,* Vol. 16, 1993.
42	M.P. Reddy, J.N. Reddy, and H.U. Akay, "Penalty-Finite Element Analysis of Incompressible Flows Using Element-By-Element Solution Algorithms," *Computer Methods in Applied Mechanics and Engineering*, Vol. 100, 1992, pp. 169-205. https://doi.org/10.1016/0045-7825(92)90182-J.
43	D.B. Burr, H.U. Akay, N. Paydar, and S. Mori, "Locally High Shear Stresses Are Associated With Stress Fracture Location," *Trans. Orthopedic Research Societies,* Vol. 17, 1992, pp. 17-33.
44	W.E. Roberts, N. Paydar, and H.U. Akay, "Finite Element Analysis of Mechanically Induced Bone Formation in Rat Molar Periodontal Ligament," *ASGSB Bulletin,* 4:33, 1990.
45	H.U. Akay, A. Ecer, and P.G. Willhite, "Finite Element Solutions of Euler Equations for Lifting Airfoils," *AIAA Journal*, Vol. 24, No. 4, 1986, pp. 27-35. https://doi.org/10.2514/3.9308
46	H.U. Akay and A. Ecer, "Applications of a Finite Element Algorithm for the Solution of Steady Transonic Euler Equations," *AIAA Journal*, Vol. 21, 1983, pp. 1518-1524. https://doi.org/10.2514/3.60152.
47	A. Ecer and H.U. Akay, "A Finite Element Formulation of Euler Equations for the Solution of Steady Transonic Flows," *AIAA Journal*, Vol. 21, 1983, pp. 343-350. https://doi.org/10.2514/3.8078.
48	H.U. Akay and A. Ecer, "Finite Element Analysis of Transonic Flows in Highly Staggered Cascades," *AIAA Journal,* Vol. 20, 1982, pp. 410-416. https://doi.org/10.2514/3.51085
49	A. Ecer and H.U. Akay, "Investigation of Transonic Flow in a Cascade Using the Finite Element Method," *AIAA Journal*, Vol. 19, 1981, pp. 1174-1182. https://doi.org/10.2514/3.60057.
50	H.U. Akay and A. Ecer, "Transonic Flow Computations in Cascades Using Finite Element Method," *ASME Journal of Engineering Power*, Vol. 103, 1981, pp. 657-664. https://doi.org/10.1115/1.3230788.
51	E. Aydinlik and H.U. Akay, "Effect of Resilient Layer in a Removable Partial Denture Base on Stress Distribution of the Mandible," *The Journal of Prosthetic Dentistry*, Vol. 44, July 1980, pp. 17-20. https://doi.org/10.1016/0022-3913(80)90039-6.
52	H.U. Akay, "An Investigation of First- and Second-Order Mixed Plate Bending Problems," *International Journal for Numerical Methods in Engineering*, Vol. 15, March 1980, pp. 351-360. https://doi.org/10.1002/nme.1620150305.
53	H.U. Akay, "Dynamic Large Deflection Analysis of Plates Using Mixed Finite Elements," *Computers and Structures*, Vol. 10, January 1980, pp. 1-11. https://doi.org/10.1016/0022-460X(88)90224-6.
54	N. Akkas, H.U. Akay, and C. Yilmaz, "Applicability of General-Purpose Finite Element Programs in Solid-Fluid Interaction Problems," *Computers and Structures*, Vol. 10, October 1979, pp. 773-783. https://doi.org/10.1016/0045-7949(79)90041-5.

55	H.U. Akay, C.P. Johnson, and K.M. Will, "Lateral and Local Buckling of Beams and Frames," *ASCE Journal of Structural Division*, Vol. 103, September 1977, pp. 1821-1832. https://doi.org/10.1061/JSDEAG.000472.
56	A. Ertepinar and H.U. Akay, "Radial Oscillations of Nonhomogeneous Thick-Walled Cylindrical and Spherical Shells Subjected to Finite Deformations," *International Journal of Solids and Structures*, Vol. 12, 1976, pp. 131-138. https://doi.org/10.1016/0020-7683(76)90034-2.
57	J.T. Oden, H.U. Akay, and C.P. Johnson, "The Effect of Higher Order Terms in Certain Finite Element Models," *AIAA Journal*, Vol. 11, November 1973, pp. 34-36. https://doi.org/10.2514/3.50644.

PROJECTS

1	"Addition of Structural and Thermal Design Capabilities to CAEeda Software," TUBITAK, TEYDEB, 04/2012-12/2014. Consultant for EDA Ltd.
2	"Development of an Aerodynamic and Structural Shape Optimization and Automation Software," TUBITAK, TEYDEB, 01/2015-06/2017. Consultant for EDA Ltd.
3	"Development of a Tanker Transportation Simulation Software," TUBITAK, TEYDEB, 09/2017-06/2020. Consultant for EDA Ltd.
4	"Development of an Incompressible Overset Mesh Interface for Unstructured Mesh Generator MESHeda," EDA Ltd, $41,922, 10/2008-09/2009. Principal Investigator.
5	"Development of Computational Fluid Dynamics Models for Improving Performance of Pharmaceutical Isolators, Phases 1 and 2," Eli Lilly and Company, $283,542, 04/2004-05/2008. Principal Investigator.
6	"Parallelization and Development of Solid-Fluid Interaction Models for Aeroelasticity," Aeronautical Engineering Department, Middle East Technical University, $57,507, 8/1999-12/2002. Principal Investigator.
7	"Dynamic Load Balancing on Heterogeneous Systems," NASA Glenn Research Center, $200,000, 9/1999-9/2000. Co-Investigator.
8	"Establishment of a Parallel Network of IBM RS/6000 Computers at the CFD Laboratory," IBM Corporation, $152,730, 12/1998-12/1999, Co-Principal Investigator.
9	"Methods for Improving the Efficiency of Heterogeneous Parallel Computation of Internal Flows," NASA Lewis Research Center, $240,000, 11/1997-10/1900. Co-Principal Investigator.
10	"Benchmarking of FEA Capabilities for Structural Analysis," $59,000, 3/1998 3/1999, Raytheon Technical Services. Principal Investigator.
11	"Prediction of Fatigue Life of Solder Joints Under Thermal Loads," $41,006, 5/1996-4/1997, United Technology/Carrier Electronics, Principal Investigator.
12	"Establishment of Distributed Computing," Dassault Aviation, France, $20,730, 09/1996-02/1997. Co-principal Investigator.
13	"Prediction of Fatigue Life of Solder Joints Under Thermal Loads," Carrier Electronics, Huntington, IN, $41,006, 05/1996-04/1997. Principal Investigator.
14	"Parallel CFD on Heterogeneous Workstations," Dassault Aviation, France, $18,000, 1996. Co-Principal Investigator.
15	"Parallel Computation of Unsteady Flows on a Network of Workstations," NASA Lewis Research Center, Cleveland, Ohio, $223,490, 03/1994-12/1996. Co-principal Investigator.
16	"Industry/University Cooperative Research Center for Advanced Electronics Interconnects," Cummins Electronics, $10,000, 11/1/1994-10/31/1996. Co-

	Principal Investigator.
17	“Industry/University Cooperative Research Center for Advanced Electronics Interconnects,” Delco Electronics, Kokomo, IN, $30,000, 11/1/94-10/31/96. Co-Principal Investigator.
18	“Industry/University Cooperative Research Center for Advanced Electronics Interconnects,” Rockwell International, $20,000, 11/1/1994-10/31/1996. Co-Principal Investigator.
19	“Conductive Epoxy Materials Research,” US Naval Air Warfare Center, Indianapolis, IN, $55,076, 9/1/94-9/13/95. Co-Principal Investigator.
20	“Lead Solder Alternatives,” US Naval Air Warfare Center, Indianapolis, IN, $8,000, 01/1994-1/1995. Co-Principal Investigator.
21	“Dynamic Load Balancing for Parallel Computations,” NASA Lewis Research Center, Cleveland, Ohio, $15,300, 1994. Co-Principal Investigator.
22	“A Computational Grid-Oriented Data Base for Parallel Computation of Turbomachinery Problems,” NASA Lewis Research Center, $223,880, 01/1991 - 01/1993. Co-Principal Investigator.
23	“Coupling of Unsteady Flows with Structural Deformations,” Dassault Aviation, France, $25,000, 1991 - 1993. Co-Principal investigator.
24	“Automated Finite Element Modeling of Circuit Card Assemblies,” US Army Research Office, $100,000, 07/1991-06/1993. Co-Principal Investigator.
25	“Parallel Computations on IBM 3090 Supercomputer,” IBM Research Center, Kingston, New York, $100,000, 01/1987-01/1993. Co-Principal Investigator.
26	“Numerical Simulation of Unsteady Compressible Euler Flows,” Ministere de la Defense, France, $25,000, 1990-1991. Co-Principal Investigator.
27	“A Block-Structured Finite Element Analysis of Wing-Nacelle Configurations,” General Electric, Cincinnati, Ohio, $65,000, 01/1987-01/1990. Co-Principal Investigator.
28	“Parallel Processing of Multi-Stage Turbomachinery,” NASA Lewis Research Center, Cleveland, Ohio, $134,000, 01/1988-01/1991. Co-Principal Investigator.
29	“Solution of Unsteady Euler Equations,” Dassault Aviation, France, $17,040, 01/1989 - 05/1990. Co-Principal Investigator.
30	“Analysis of Three-Dimensional Flows Through Blade Passages of Hydraulic Retarders and Torque Converters,” Detroit Diesel Allison Division of GM, Indianapolis, IN, $49,500, 1984-1985. Co-Principal Investigator.
31	“Finite Element Analysis of Flows Through Turbine Volutes,” Schwitzer Corporation, Indianapolis, IN, $8,000, 01/1984-12/1984. Co-Principal Investigator.
32	“A Zonal Approach to the Design of Finite Element Grids for 3-D Transonic Flows with Complex Geometries,” US Air Force, Office of Scientific Research, $122,962, 09/1983-09/1986. Co-Investigator.
33	“Analysis of Three-Dimensional Transonic Potential Flows Using Optimum Grids,” US Air Force, Office of Scientific Research, $143,978, 09/1981-09/1983. Co-Investigator.
34	“Finite Element Analysis of Transonic Flow Through a Cascade of Airfoils Using a Self Adaptive Mesh,” NASA Research Center, $203,947, 01/1980-12/1983. Co-Principal Investigator. https://doi.org/10.2514/6.1980-1430

CONFERENCE PRESENTATIONS (RECENT)

1	N. Senol, H.U. Akay, Ş. Yigit, "*A Surrogate Model Based Shape Optimization Framework for Compressible Flows*," 35th Int. Conference on Parallel Computational Fluid Dynamics, University Club Bonn, Germany, Sept. 03-05, 2024.
2	A.K.A. Hameed, H.U. Akay, B.B. Kentel, *"Finite Element Analysis of the Lumbar Vertebrae L4-L5 Segment with Ligaments*," The 19th International Conference on Machine Design and Production, Cappadocia, Turkey, August 31 - September 3, 2022.
3	M. Omair and H.U. Akay, "*Enhanced Thermophysical Models for Simulating Combustion at Supercritical Pressures Using OpenFOAM*," 33rd International Conference on Parallel Computational Fluid Dynamics, Alba, Italy, May 25-27, 2022.
4	M. Omair, H.U. Akay, "*Non-Premixed Turbulent Combustion In Cryogenic Jet Flames at Elevated Pressures,*" 32nd Int. Conference on Parallel Computational Fluid Dynamics, Niece, France, May 17-19, 2021.
5	S. Abuhanieh, H.U. Akay, B. Bicer, "*A New Strategy For Solving Store Separation Problems Using OpenFoam*," 32nd Int. Conference on Parallel Computational Fluid Dynamics, Niece, France, May 17-19, 2021.
6	M. Omair and H.U. Akay, "*Effects of Chamber Pressure Variation On Pollutant Formation In Cryogenic Combustion*," 2021 International Bhurban Conference on Applied Sciences and Technologies (IBCAST), İslamabad, Pakistan, Jan 12-16, 2021. https://doi.org/10.1109/IBCAST51254.2021.9393022.
7	E. Oktay, A. Arpaci, O.T. Sehitoglu, and H.U. Akay, "*A Parallel Aerostructural Shape Optimization Platform for Airplane Wings*," 31st Int. Conference on Parallel Computational Fluid Dynamics, Antalya, Turkey, May 14-17, 2019.
8	S.K. Abuhanieh and H.U. Akay, "*Parallel CFD Modeling of Cold Flow in Gas Circuit Breakers,*" 31st Int. Conference on Parallel Computational Fluid Dynamics, Antalya, Turkey, May 14-17, 2019.
9	S.H. Edeeb, H.U. Akay, and S. Ozden, "Experiences with Parallel Ice Accretion Simulations of Airplane Wings Icing OpenFOAM," 31st Int. Conference on Parallel Computational Fluid Dynamics, Antalya, Turkey, May 14-17, 2019.
10	H.U. Akay, N. Senol, A. Eraslan, '*Parallel Solution of Flow Topology Optimization Problems on OpenFoam Platform*, 30th Int. Conference on Parallel Computational Fluid Dynamics, Indianapolis, Indiana, USA, May 14-17, 2018.
12	H.U. Akay, E. Oktay, M. Manguoglu, A.A. Sivas, "*Improved Parallel Preconditioners for Multiphysics Topology Optimizations*," 27th International Conference on Parallel Computational Fluid Dynamics," Montreal, Canada, pp 174-176, May 17-20, 2015.
12	H.U. Akay, "*Development of Integrated Engineering Analysis and Design Tools from Solid Modeling to Design Optimization*", Parallel Computational Fluid Dynamics Conference, National Supercomputing Center, Changsha, Hunan, China, May 20-24, 2013 (invited talk).
13	E. Oktay and H.U. Akay, "*Structural Topology Optimization Under Aerodynamic Loads Using PETSc as a Parallel Solver*," Parallel CFD 2012, Atlanta, GA, USA, May 20-24, 2012.
14	E. Oktay, H.U. Akay, O. Merttopcuoglu, C. Sener, "Parallelized Structural Topology Optimization and CFD Coupling for Design of Aircraft Structures," Parallel CFD 2010, Taiwan, May 17-21, 2010.
15	H.U. Akay, R. Payli, J. Liu, and Akin Ecer, "*An Overset Unstructured Grid Method for Parallel Solvers*," *Parallel CFD 2009*, NASA Ames Research Center, Moffett Field, CA, May 18-22, 2009.

16	E. Oktay, O. Merttopcuoglu, C. Sener, A. Ketenci, and H.U. Akay, "*Parallel Shape Optimization of a Missile on a Grid Infrastructure,*" *Parallel CFD 2008*, Edited by D. Tromeur-Dervout, et al., Springer- Verlag, pp. 51-60, 2010.
17	E. Yilmaz, R.U. Payli, H.U. Akay, A. Ecer, and J. Liu, "*Scalability Considerations of a Parallel Flow Solver on Large Scale Computing Systems*," *Parallel CFD 2008*, Edited by D. Tromeur-Dervout, et al., Springer-Verlag, pp. 321-330, 2010.
18	S. Chien, G. Makinabakan, A. Ecer, and H.U. Akay, "*Dynamic Load Balancing on Windows Based Multi-core PCs,*" Parallel CFD 2008, Edited by D. Tromeur-Dervout, et al., Springer-Verlag, pp. 339-346, 2010.

CITATIONS

Sum of times cited without self-citations (ISI Web of Science):	778
H-index (ISI Web of Science):	15
Sum of times cited without self-citations (Scopus):	1231
H-Index (Scopus):	18
Citations (Google Scholar):	2232
H-index (Google Scholar):	23

COURSES TAUGHT AT ATILIM UNIVERSITY

1	AE 111 Fundamentals of Automotive Engineeering
2	AE 307 Fluid Mechanics I
3	ME 436 Fluid Mechanics II
4	ME 437 Introduction to Computational Fluid Dynamics
5	ME 684 Finite Element Analysis of Solids and Fluids I
6	ME 621 Advanced Fluid Mechanics

THESES SUPERVISED

1	Niyazi Şenol, PhD, Thesis: "*Development of a Surrogate and GEK-Based Multipoint Optimization Framework for Aerospace Applications*," Atilim University (in progress).
2	Erem Kutluyuva: MSME Thesis: "Investigation of Aeroelastic Effects on Wing Systems," Atilim University (in progress).
3	Yaşar Çalışkan: MSME Thesis: "Cost of Ownership Comparative Analysis Between Electric Vehicles (EVs) and Internal Combustion Engine Vehicles (ICEVs), " Atilim University (in progress).
4	Orhan Güngör: MSME Thesis: "Accelerating Fluid Flow Optimization Problems Using Machine Learning," Atilim University, July 2025.
5	Muhammad Omair, PhD, Thesis: "*Implementation of an Improved Equation of State in Openfoam for Mixing and Combustion of Real Fluids*," Atilim University, May 2023.
6	Adil Kadhim Abdulabbas Hameed, MSME, Thesis: "*Biomechanical Finite Element Models for Lumbar Vertebrae L4, L5 and Sacrum Vertebra S1*," Atilim

	University, January 2023.
7	Murat Çığıl Kılıçkaya, "*Design, Fabrication, Instrumentation and Testing of an Educational Wind Tunnel*," Atilim University, March 2022.
8	Saleh Abu Hanieh, PhD, Thesis: "*Solution of Store Separation Problems Using Openfoam*," Atilim University, March 2022.
9	Sogair Edeeb, PhD, Thesis: "*Simulation of Icing on Aircraft Wings Using OpenFoam,"* Atilim University, February 2019.
10	Niyazi Şenol, MSME, Thesis: "*Topology Optimization of Thermal Fluid Problems Using OpenFoam*," METU, February 2019 (co-supervisor).
11	Jingxin Liu, *PhD, Thesis*: *"Simulating Unsteady Flow of Moving Flow and Control Valves by an Unstructured Overset Grid Method,"* December 2008.
12	Cai Shen, MSME, Thesis: *"CFD Models for Flow and Mass Transfer of Hydrogenperoxide in Pharmaceutical Isolators,"* December 2008.
13	Cem Ersungur, MSME, Thesis: *"Kinetic Monte Carlo Molecular Simulations for Fuel Cell Applications and Surface Reactions," IUPUI,* August 2007.
14	Amit Baddi, MSME, Thesis: *"Parallel Computations of Solid-Fluid Interactions Problems," IUPUI,* December 2005.
15	Xiaoyin He, MSME, Thesis: *"Parallel Computations of Solid-Fluid Interactions Using Arbitrary Lagrangian-Eulerian and Relative Coordinate Formulations,"* IUPUI, May 2004.
16	Zhenyin Li, *MSME, Thesis*: *"Parallel Computations of 3D Unsteady Compressible Euler Equations with Structural Coupling,"* IUPUI, August 2002.
17	Yan Liu, MSME, Thesis: *"Simplified 2D/3D Models for Fatigue Life Prediction of BGA Solder Joints of Electronic Packages,"* IUPUI, August 2001.
18	Christoffer Bronnenberg, MSME, Thesis: *"An Unstructured Grid Partitioning Program For Parallel Computational Fluid Dynamics,"* IUPUI, August 1999.
19	Ali Uzun, MSME, Thesis: *"Parallel Computations of Unsteady Euler Equations on Dynamically Deforming Unstructured Grids,"* IUPUI, August 1999 (co-supervisor).
20	Jamie Workman, MSME, Thesis: "3D Unstructured Grids for Unsteady Compressible Flows," IUPUI, August 1999.
21	Gunasekaran Kaliappan, MSME, Thesis: *"A Comparative Evaluation of Fatigue Life Prediction Methods for Solder Joint Assemblies,"* IUPUI, May 1999.
22	Hongyan Zhang, MSME, Thesis: "Combined Heat Transfer and Thermal Stress Analysis of Power Resistor Assemblies for Fatigue Life Predictions," IUPUI, May 1998.
23	Karoly Fekete, MSE, Thesis: *"A Domain Decomposition Based Parallel Solver for Incompressible Navier-Stokes Equations Using the Finite Element Method,"* IUPUI, August 1997.
24	Ahmet B. Acikmese, MSME, Thesis: "*Parallel Computations of Unsteady Compressible Viscous Flows Using the Finite Element Method*," IUPUI, May 1996.
25	Geoffrey L. Glogas, MSME, Thesis: "*Experimental Study of Viscoelastic Properties of a Conductive Adhesive for Electronic Packaging*," IUPUI, May 1996.
26	Altug Bilgic, MSME, Thesis: "*Fatigue Life Prediction Methods for Thermally Loaded Solder Joints Using the Finite Element Method*," IUPUI, May 1996.
27	Xu Song, MSME, Thesis: "*Numerical Modeling of Creep Phenomena in Adhesive Epoxy and Solder Joint Assemblies of Electronic Packages*," IUPUI, August 1995.
28	Yuehua Chen, MSME, Thesis: "*Parallel Solution of Unsteady Compressible Euler Equations Using the Finite Element Method*," IUPUI, August 1995.
29	Ozan Selcuk, MSME, Thesis: "*Parallel Solution of Coupled Unsteady*

	Compressible Flow and Aeroelasticity Equations," IUPUI, August 1994.
30	William B. Kemle, MSME, Thesis: "*Parallel Implementation of a Three-Dimensional Unsteady Potential Finite Element Flow Solver*," May 1993.
31	Jeffrey Haskett, MSME, Thesis: "*Stress Fracture Investigation of a Rabbit Tibia Using Finite Element Analysis*," IUPUI, August 1993 (co-supervisor).
32	Ali Beskok, MSME, Thesis: "*A Parallel Algorithm for the Time-Averaged Solution of the Rotor-Stator Interaction Problem*," IUPUI, May 1991 (co-supervisor).
33	Evangelos Spyropoulos, MSME, Thesis: "*Finite Element Solution of the Unsteady Euler Equations Employing Clebsch Variables*," May 1990 (co-supervisor).
34	David Turner, MSME, Thesis: "*Finite Element Analysis of the Three--Dimensional Euler Equations in a Rotating Turbomachinery Blade Passage*," IUPUI, May 1988 (co-supervisor).
35	Paul Willhite, MSME, Thesis: "*Finite Element Solution of Transonic Euler Equations Around Lifting Airfoils*," IUPUI, May 1985.
36	Ismail H. Tuncer, MSME, Thesis: "*Design of Three-Dimensional Finite Element Grids for Transonic Flows Around Wing-Body Combinations*," IUPUI, May 1983 (co-supervisor).
37	John Spyropoulos, MSME, Thesis: "*An Investigation of a Finite Element Algorithm for Two-Dimensional Inviscid Rotational Flows*," IUPUI, May 1983 (co-supervisor).
38	Beyazit Sener, MSME, Thesis: "*Finite Element Analysis of Three Dimensional Euler Equations*," IUPUI, May 1983 (co-supervisor).
39	Bilal Bhutta, MSME, Thesis: "*Finite Element Solution of Three Dimensional Potential Flows*," IUPUI, May 1982 (co-supervisor).
40	Oguzhan Gurdogan, MSCE, Thesis: "*Isoparametric Finite Elements for Stress Intensity Computations in Fracture Mechanics*," METU, December 1978.
41	Mehmet Utku, MSCE, Thesis: "*Finite Element Solution of Transonic Flow Problems*," METU, May 1978.
42	Tacettin Sarioglu, MSCE, Thesis: "*Development of Mixed Plate Bending Isoparametric Elements*," METU, May 1978.
43	Turgut Tokdemir, PhD, Dissertation: "*A Finite Element Galerkin Formulation for the Dynamic Analysis of Linear Viscoelastic Two-Dimensional Solids*," METU, May 1977 (co-supervisor).