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Curriculum Vitae of Dr. Güçlü Seber

Education

1998–2004   University of California, Los Angeles   CGPA: 3.98/4.00
- Ph. D. in Aerospace Engineering, June 2004
- M. S. in Aerospace Engineering, June 2000

1994–1998   Middle East Technical University (METU), Ankara, Turkey   CGPA: 3.94/4.00
- B. S. in Aerospace Engineering, June 1998

Graduate Level Coursework Includes:
- Major Field (Structural Dynamics): Aeroelastic Effects in Structures, Advanced Structural Dynamics, Finite Element Analysis in Engineering
- Minor Field (Aerodynamics): Incompressible and Compressible Flows, Viscous and Turbulent Flows

Research Interests and Skills

- Aeroelasticity (Classical and Numerical), Structural Dynamics, Finite Element Method, Optimization, Morphing Aircraft, Wind Turbines and Renewable Energy, CFD
- MSC NASTRAN/PATRAN/FLDS, ABAQUS, FORTRAN , C++, Python, MATLAB

Awards and Honors

- Received UCLA Aerospace Engineering 2004 Outstanding Ph.D. Student Award given to individuals with exceptional research and academic skills.
- Received UCLA MAE Department Fellowship, a total sum of $29,000, covering all living and academic expenses for the academic year of 1998-1999.
- Graduated METU Aerospace Engineering Department as a High Honor Student, ranking first among 45 classmates with a CGPA of 3.94/4.00.

Work Experience

2006-Present   METU, Aerospace Engineering Department, Ankara, Turkey

Assistant Prof. Dr.

- Taught undergraduate level courses *Statics*, *Dynamics*, *Applied Elasticity*, *Aerospace Structures*, *Mechanical Vibrations*, *Wind Energy and Wind Turbine Technology* (as a co-instructor) and graduate level course *Aeroelastic Effects in Structures*.
- Currently supervising 5 graduate students.
- Conducting research on *Aeroservoelastic Analysis of Mission-Adaptive Tactical Unmanned Aerial Vehicles* project funded by *Turkish Scientific and Technological Research Council*. Designed and analyzed a novel hingeless control surface concept, which will be integrated to a test aircraft. Other contributions include finite element structural modeling, aerodynamic and aeroelastic analysis, code development for automated tasks, supervision of 3 graduate research assistants and project documentation.
- Has been a structural consultant to *Turkish Aerospace Industries, Inc.*, *Design of a Satellite Moment Control Gyroscope Project*. Performed and been responsible for all structural analyses required for space qualification of designs within scheduled deadlines. Duties included finite element modeling and analyses, determination of load cases, calculation of stresses and dynamic response under sinusoidal and random excitations, documentation and attending critical design reviews.
- Has been a consultant to *Helis Engineering, Inc., Design and Optimization of a 20 kW Autonomous Wind Turbine Project*. Responsibilities included structural sizing and optimization for weight/cost reduction, finite element modeling of the blades, tower and other components, determination of load cases, static and dynamic analysis, documentation and attending design reviews.

Work Experience (continued)

2004-2006   M4 Engineering, Inc., Long Beach, CA

Senior Aerospace Engineer (Employer: Dr. Myles L. Baker)

- Has been responsible for research and development efforts in several projects and performed finite element analyses, automated model and mesh generation, optimization, and code development/integration tasks in a fast-paced small business serving many customers.
- Commonly used and integrated computer tools NASTRAN, PATRAN, ABAQUS, DAKOTA, Python, C++ and FORTRAN for automation and optimization related tasks.
- Wrote, presented and contributed to several progress reports and business proposals to satisfy customer requirements and successfully bring in new business.

    List of Projects:

- *Weapons Weight Reduction Program of the US Army* ~ Led the development efforts of NASTRAN compatible in-house finite element software FEM4 by writing several C++ and Python codes. Improved the speed and memory management capabilities by adopting the library of sparse linear solvers 'TAUCS', and by using code optimization and profiling techniques.
- *Articulated Stable Ocean Platform (ASOP) Project of the US Navy* ~ Led the structural design, sizing and optimization efforts. Performed load surveys and trade studies for over 150 configurations. Determined structurally optimum configurations and generated models for WAMIT software for further hydrodynamic analysis.
- *Composite Rocket Motor Optimization Project of the US Army* ~ Designed a finite element based shape optimization process for filament wound rocket motor cases. This process theoretically reduced critical fiber stresses up to 30% by minor reshaping of the dome geometry (later verified by experiments to be around 20%). Integrated this process into the in-house *Motor Case Design Software* by which users can generate ABAQUS finite models and control the shape optimization through interactive menus.
- *Unsteady Aerodynamic Model Tuning Project of NASA Dryden Research Center* ~ Developed a toolkit in frequency domain using Python to introduce magnitude and phase type corrections to numerical unsteady aerodynamic formulations to improve correlation with wind tunnel or flight test data for aeroelastic applications. Tested this toolkit using a test problem and successfully minimized errors.

1999–2004   MAE Department, University of California, Los Angeles

Graduate Research Assistant (Supervisor: Prof. Dr. Oddvar O. Bendiksen)

- Thesis Title: Aeroelastic Wing Response Analysis Using Finite Elements in a Large Deformation Direct Eulerian-Lagrangian Formulation
- Formulated a nonlinear structural model for the *Transonic Wing Flutter Project* funded by *NASA Dryden Research Center*. Integrated this finite element based model into the time-domain transonic aeroelastic code. Improved the accuracy of the dynamic mesh motion and aerodynamic load calculations using element attached coordinate systems. Performed a systematic study on the nonlinear aeroelastic behavior of several wing models. Documented some unique aeroelastic phenomena and successfully simulated the wind tunnel limit cycle oscillations of a transport type wing, which cannot be predicted by a linear structural model.

Graduate Teaching Assistant

- Assigned as a teaching assistant to courses 'Introduction to Mechanical Vibrations', 'Preliminary Design of Aircraft' and 'Design of Aerospace Structures' for a total of 12 semesters. Acquired valuable experience and knowledge in iterative design procedures through various teaching duties. Held regular discussion sessions to assist the students, provided feedback on projects, homework assignments and course material, prepared supplementary handouts, and assisted professors in grading.

List of Publications

Journal Papers

1. Bendiksen, O. O., Seber, G., 'Fluid-Structure Interactions with both Structural and Fluid Nonlinearities', Journal of Sound and Vibration, Special Issue on Geometrically Nonlinear Vibrations, vol. 315 (3), pp 664-684, August 2008.

2. Seber, G., Bendiksen, O. O., 'Nonlinear Flutter Calculations Using Finite Elements in a Large Deformation Direct Eulerian-Lagrangian Formulation', AIAA Journal, vol. 46, no 6, p1331-1341, June 2008.

Conference Papers

1. Seber, G., Ünlüsoy, L., Sakarya, E., 'Flutter Characteristics of Typical Section Models with Control Surfaces', 5th Ankara International Aerospace Conference, August 17-19, 2009, METU, Turkey.

2. Seber, G., Sakarya, E., Insuyu, T. E., Sahin, M., Sozgen, S., Yaman, Y., 'Structural Modeling and Flutter Analysis of Adaptive Camber Wings', 5th Ankara International Aerospace Conference, August 17-19, 2009, METU, Turkey.

3. Seber, G., Sakarya, E., Insuyu, T. E., Sahin, M., Sozgen, S., Yaman, Y., 'Evaluation of a Camber Morphing Concept Based on Controlled Flexibility', International Forum on Aeroelasticity and Structural Dynamics, June 21 – 5, 2009, Seattle, Washington.

4. Karadal, F. M., Nalbantoglu, V., Sahin, M., Seber, G., Kırcalı, O. F., 'Active Control of a Smart Fin', 19th International Conference on Adaptive Structures and Technologies, October 6-8, 2008, Ascona, Switzerland.

5. Karadal, F. M., Seber, G., Sahin, M., Nalbantoglu, V., Yaman, Y., 'State Space Representation of Smart Structures under Unsteady Aerodynamic Loading', 4th Ankara International Aerospace Conference, September 10-12, 2007, METU, Turkey.

6. Bendiksen, O. O., Seber, G., 'A Direct Fluid-Structure Coupling Scheme for Nonlinear Finite Element Aeroelastic Codes', International Forum on Aeroelasticity and Structural Dynamics, June 18 – 20, 2007, Stockholm, Sweden.

7. Seber, G., Baker, M. L., Roughen, K., Griffin, J. L., Triplett, M. H., 'A Process for Shape Optimization of Filament Wound Pressure Vessels', 11th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, September 6-8, 2006, Portsmouth, Virginia.

8. Kevin, R., Baker, M. L., Seber, G., Taylor, T. M., 'A System for Aerothermodynamic, Servo, Thermal, Elastic, Propulsive Coupled Analysis (ASTEP), 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, May 1-4, 2006, Newport, Rhode Island.

9. Bendiksen, O. O., Seber, G., 'Time-Accurate Finite Element Calculations of the Nonlinear Aeroelastic Response Involving Large Deformations', International Forum on Aeroelasticity and Structural Dynamics, June 28 – July 1, 2005, Munich, Germany.

10. Seber, G., Bendiksen, O. O., 'Nonlinear Flutter Calculations Using Finite Elements in a Large Deformation Direct Eulerian-Lagrangian Formulation', 46th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, 18-21 April 2005, Austin, Texas.

References Available upon request.