

Serdar Göktepe

Computational Biomechanics Group
Mechanics and Computation
Department of Mechanical Engineering
Stanford University
<http://www.stanford.edu/~goktepe>
<http://biomechanics.stanford.edu>

496 Lomita Mall
Durand Building Rm.226
Stanford CA-94305-4040
Phone: +1.650.799.8769
Fax: +1.650.725.1587
goktepe@stanford.edu

EDUCATION

- Dr.-Ing., Civil Engineering
2002-2007 University of Stuttgart, Germany
Graduation with Distinction
Advisor: Prof. Dr. Christian Miehe
Thesis: "Micro-Macro Approaches to Rubbery and Glassy Polymers:
Predictive Micromechanically-Based Models and Simulations".
- M.Sc., Computational Mechanics of Materials and Structures (COMMAS)
2000-2002 University of Stuttgart, Germany
GPA: 1.2 (Scale: 1.0-5.0, 1.0 best)
Advisor: Prof. Dr. Christian Miehe
Thesis: "Micromechanically Based Description of Damage in Polymers at Large Strains".
- B.Sc., Civil Engineering
1994-1999 Middle East Technical University, Ankara, Turkey
GPA: 3.59/4.0

ACADEMIC EXPERIENCE

- Postdoctoral Scholar at the Computational Biomechanics Group at Stanford University, 2007-present.
- Research Associate at the Institute of Applied Mechanics, University of Stuttgart, 2002-2007.
- Graduate Student Assistant at the Institute of Applied Mechanics, University of Stuttgart, 2001-2002.
- Graduate Teaching Assistant at the Department of Civil Engineering, Middle East Technical University, 1999-2000.

TEACHING EXPERIENCE

- Lecturer, Continuum Mechanics, Stanford University, Winter 2009 (with Prof. E. Kuhl).
- Lecturer, Computational Modeling of Cardiac Electromechanics, COMMAS Summer School, University of Stuttgart, October 6-10, 2008.
- Lecturer, Continuum Mechanics, Stanford University, Spring 2008 (with Prof. E. Kuhl).
- Lecturer, Micromechanics of Materials and Homogenization Methods, University of Stuttgart, Spring 2007.
- Teaching Assistant, Micromechanics of Materials and Homogenization Methods, University of Stuttgart, Spring 2003.
- Teaching Assistant, Computational Mechanics of Materials, University of Stuttgart, Fall 2002.
- Teaching Assistant, Advanced Structural Analysis, Middle East Technical University, Fall 1999 and Spring 2000.
- Teaching Assistant, Structural Analysis, Middle East Technical University, Fall 1999.

SPECIAL SKILLS

- Languages: Turkish (native), English, German.
- Programming languages: FORTRAN, C.
- Scientific computing programs: MATLAB[®], MATHCAD[®], and MAPLE[®].
- Knowledge of Unix/Linux operating systems.

HONORS

- Graduation with Distinction, Ph.D., from the University of Stuttgart, 2007.
- Best Ph.D. student presentation award (shared with Dipl.-Ing. P. Höfer) in the Fifth European Conference for Constitutive Models for Rubber (ECCMR), September 4-7, 2007, Paris, France.
- Graduation with Honors, M.Sc., from the master program COMMAS at the University of Stuttgart, 2002.
- Robert Bosch GmbH Scholarship – 2000-2002.
- Graduation with Honors, B.Sc., from the Department of Civil Engineering at the Middle East Technical University, 1999.

PROFESSIONAL MEMBERSHIPS

- 1999– Turkish Chamber of Civil Engineers
- 2007– Association of Applied Mathematics and Mechanics (Gesellschaft für Angewandte Mathematik und Mechanik e.V.) (GAMM)
- 2008– Stanford Cardiovascular Institute

PROFESSIONAL ACTIVITIES

- Referee for:
 - International Journal of Solids and Structures (IJSS)
 - International Journal for Numerical Methods in Engineering (IJNME)
 - ASME Journal of Applied Mechanics (JAM)
 - Computer Methods in Biomechanics and Biomedical Engineering (CMBBE)
 - Macromolecular Materials and Engineering (MME)

THESES SUPERVISED

- M.Sc. Thesis “Finite Elastic and Inelastic Behavior of Rubbery Polymers: Experiments and Modeling” of Joel Méndez Diez, 2004. (Co-supervisor: S. Lee)[†]
- M.Sc. Thesis “A Formulation of Finite Viscoplasticity for Glassy Polymers in the Logarithmic Strain Space” of Arun P. Balasubramanian, 2004.[†]
- M.Sc. Thesis “Parameter Identification for Material Models from Inhomogeneous Experiments with Three-Dimensional Surface Matching” of Aruna Prakash, 2005. (Co-supervisor: A. Rieger)[†]
- M.Sc. Thesis “Approaches to Modeling of Thermoviscoplastic Behavior of Glassy Polymers” of Hüsnü Dal, 2005.[†]
- M.Sc. Thesis “Micromechanically Based Thermo-Viscoplasticity of Glassy Polymers: Experiments and Constitutive Modeling” of Harish Iyer, 2006. (Co-supervisor: J. Méndez)[†]
- M.Sc. Thesis “Temperature-Dependent Finite Viscoplasticity of Glassy Polymers: Experiments and Simulations” of Shaofei Qu, 2007. (Co-supervisor: J. Méndez)[†]
- Diploma Thesis “Anisotropic Finite Viscoelasticity of Rubber-like Materials” of Dirk Liefeth, 2007. (Co-supervisor: Dr. Stefan Kolling, Daimler AG)[†]

[†] Jointly supervised with Prof. C. Miehe at the Institute of Applied Mechanics, Stuttgart.

REFERENCES

References will be provided upon request.

Publications

JOURNAL PUBLICATIONS

C. Miehe, **S. Göktepe** and F. Lulei: "A Micro–Macro Approach to Rubber–Like Materials. Part I: The Non–Affine Micro–Sphere Model of Rubber Elasticity", *Journal of the Mechanics and Physics of Solids*, vol. 52, 2004, pp. 2617–2660.

C. Miehe and **S. Göktepe**: "A Micro–Macro Approach to Rubber–Like Materials. Part II: The Micro–Sphere Model of Finite Rubber Viscoelasticity", *Journal of the Mechanics and Physics of Solids*, vol. 53, 2005, pp. 2231–2258.

S. Göktepe and C. Miehe: "A Micro–Macro Approach to Rubber–Like Materials. Part III: The Micro–Sphere Model of Anisotropic Mullins–Type Damage", *Journal of the Mechanics and Physics of Solids*, vol. 53, 2005, pp. 2259–2283.

K. Garikipati, **S. Göktepe** and C. Miehe: "Elastica-based Strain Energy Functions for Soft Biological Tissue", *Journal of the Mechanics and Physics of Solids*, vol. 56, 2008, pp. 1693–1713.

S. Göktepe and C. Miehe: "Efficient Two-Scale Modeling of Finite Rubber Viscoelasticity", *Technische Mechanik*, vol. 28, 2008, pp.22–31.

C. Miehe, **S. Göktepe** and J. Méndez: "Finite Viscoplasticity of Glassy Polymers in the Logarithmic Strain Space", *International Journal of Solids and Structures*, vol. 46, 2009, pp.181–202.

S. Göktepe and E. Kuhl: "Computational Modeling of Cardiac Electrophysiology: A Novel Finite Element Approach", *International Journal for Numerical Methods in Engineering*, vol. 79, 2009, pp.156–178.

M. Kotikanyadanam, **S. Göktepe** and E. Kuhl: "Computational Modeling of Electrocardiograms: A Finite Element Approach Towards Cardiac Excitation", *Communications in Numerical Methods in Engineering*, DOI: 10.1002/cnm.1273, 2009.

JOURNAL PUBLICATIONS (IN REVIEW)

S. Göktepe, J. Wong and E. Kuhl: "Atrial and Ventricular Fibrillation - Computational Simulation of Spiral Waves in Cardiac Tissue", submitted for publication, 2008.

S. Göktepe, W. Bothe, J-P. E. Kvitting, J. C. Swanson, N. B. Ingels. D. C. Miller and E. Kuhl: "Mitral Leaflet Curvature in the Beating Heart: Videofluoroscopic Marker Analysis and Subdivision Surface Techniques", submitted for publication, 2009.

PROCEEDINGS

M. U. Polat, **S. Göktepe** and E. Gürses: "Prefabrike Çerçeve ve Panel Duvar Yapısal Sistemlerin Deprem Davranışı ve Sismik Rehabilitasyonu", *Deprem ve Prefabrikasyon - 10. Prefabrikasyon Sempozyumu Bildiri Kitabı*, 2000, pp. 117–126. (In Turkish)

S. Göktepe and C. Miehe: "A New Micromechanically Based Approach for the Elastic Response of Rubber-like Materials at Large Strains", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 3, 2003, pp. 174–175.

S. Göktepe and C. Miehe: "The Micro-Sphere Model for Rubber Viscoelasticity: A Micromechanically Based Network Model for Polymers", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 4, 2004, pp. 191–192.

S. Göktepe and C. Miehe: "A Micromechanically Based Network Model for Rubbery Polymers Incorporating Mullins-Type Stress Softening", *Proceedings of the XXI International Congress of Theoretical and Applied Mechanics ICTAM 2004*, 15-21 August 2004, Warsaw, Poland.

S. Göktepe, J. Méndez and C. Miehe: "A Formulation of Finite Viscoplasticity for Amorphous Glassy Polymers in the Logarithmic Strain Space", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 5, 2005, pp. 269–270.

- S. Göktepe** and C. Miehe: "A Micro–Macro Approach to Rubbery Polymers Incorporating Anisotropic Evolution of Mullins-type Damage", In Austrell,P.-E.,Kari, L. (Editors), *Constitutive Models for Rubber IV*, vol. 4, 2005, pp. 215–221.
- S. Göktepe** and C. Miehe: "Coupled Finite Thermoviscoplasticity of Glassy Polymers", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 6, 2006, pp. 437–438.
- J. Méndez, **S. Göktepe** and C. Miehe: "Experiments and Identifications for Finite Polymer Inelasticity", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 6, 2006, pp. 401–402.
- S. Göktepe** and C. Miehe: "An Efficient Micro-Macro Approach to Finite Rubber Viscoelasticity", In Boukamel et al.(Editors), *Constitutive Models for Rubber V*, vol. 5, 2007, pp. 119–125.
- S. Göktepe**, J. Méndez and C. Miehe: "Finite Thermoviscoplasticity of Amorphous Glassy Polymers: Experiments, Modeling and Simulations", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 7, 2007, pp. 4060041–4060042.
- J. Méndez, **S. Göktepe** and C. Miehe: "Temperature and Rate Effects in Finite Viscoplasticity of Glassy Polymers at Different Deformation Modes: Experiments and Simulations", *Proceedings in Applied Mathematics and Mechanics PAMM*, vol. 8, 2008, pp. 10445–10446.
- J. Ulerich, **S. Göktepe** and E. Kuhl: "First Attempts Towards the Computational Simulation of Novel Stem-Cell Based Post-Infarction Therapies", *Proceedings of the ASME Summer Bioengineering Conference*, Marco Island, Florida, USA, SBC2008-192715, 2008.
- S. Göktepe**, J. Ulerich and E. Kuhl: "How to Treat the Loss of Beat: Modeling and Simulation of Growth and Remodeling and Novel Post-Infarction Therapies", *Proceedings of the ASME Summer Bioengineering Conference*, Marco Island, Florida, USA, SBC2008-193159, 2008.
- S. Göktepe**, J. Ulerich, O. Abilez, C.K. Zarins and E. Kuhl: "Computational Design of Novel Stem Cell Based Therapies for Myocardial Infarction", *Proceedings of the XXII ICTAM*, Adelaide, Australia, 2008.
- J. Ulerich, **S. Göktepe** and E. Kuhl: "Dilation and Hypertrophy – A Cell-Based Continuum Mechanics Approach Towards Ventricular Growth and Remodeling", *Proceedings of the IUTAM Symposium on Cellular, Molecular and Tissue Mechanics*, Woods Hole, Massachusetts, USA, 2008.
- S. Göktepe** and E. Kuhl: "Electromechanics of Cardiac Tissue: A Unified Approach to the Fully Coupled Excitation-Contraction Problem", *Proceedings in Applied Mathematics and Mechanics PAMM*, to appear, vol. 9, 2009.
- J. Wong, **S. Göktepe** and E. Kuhl: "Computational Simulation of Traveling Arrhythmic Waves in Myocardial Tissue", *Proceedings of the ASME Summer Bioengineering Conference*, Lake Tahoe, California, USA, SBC2009-206552, 2009.

LECTURE
PRESENTATIONS

- S. Göktepe** and C. Miehe: "A New Micromechanically Based Approach for the Elastic Response of Rubber-like Materials at Large Strains", GAMM Annual Scientific Conference, March 24-28, 2003, Abano Terme, Italy.
- S. Göktepe** and C. Miehe: "The Micro-Sphere Model for Rubber Viscoelasticity: A Micromechanically Based Network Model for Polymers", GAMM Annual Scientific Conference, March 21-27, 2004, Dresden, Germany.
- S. Göktepe**: "A Micromechanically Based Constitutive Approach to the Modeling of Hysteresis Effects in Rubbery Polymers", Colloquium at the Chair of Applied Mechanics, University of Kaiserslautern, July 22, 2004, Kaiserslautern, Germany.
- S. Göktepe** and C. Miehe: "A Micromechanically Based Network Model for Rubbery Polymers Incorporating Mullins-Type Stress Softening", ICTAM 2004, XXI International Congress of Theoretical and Applied Mechanics, August 15-20, 2004, Warsaw, Poland.

- S. Göktepe, J. Méndez and C. Miehe: "A Formulation of Finite Viscoplasticity for Amorphous Glassy Polymers in the Logarithmic Strain Space", GAMM Annual Scientific Conference, March 28-April 01, 2005, Luxembourg.
- S. Göktepe and C. Miehe: "A Micro-Macro Approach to Rubbery Polymers Incorporating Anisotropic Evolution of Mullins-type Damage", Fourth European Conference for Constitutive Models for Rubber (ECCMR), June 27-29, 2005, Stockholm, Sweden.
- S. Göktepe and C. Miehe: "Coupled Finite Thermoviscoplasticity of Glassy Polymers", GAMM Annual Scientific Conference, March 27-31, 2006, Berlin, Germany.
- S. Göktepe, J. Méndez and C. Miehe: "Viscoplasticity of Glassy Polymers: Experiments, Modeling and Simulations", Hybrid Materials for High Performance Systems (HYPER), October 12-13, 2006, Darmstadt, Germany.
- S. Göktepe and C. Miehe: "Two-Scale Modeling of Rubbery and Glassy Polymers", First GAMM/GACM-Seminar on Multiscale Material Modeling, April 20-21, 2007, Saarbrücken, Germany.
- S. Göktepe, J. Méndez and C. Miehe: "Finite Thermoviscoplasticity of Amorphous Glassy Polymers: Experiments, Modeling and Simulations" GAMM Annual Scientific Conference, July 16-20, 2007, Zurich, Switzerland.
- S. Göktepe and C. Miehe: "An Efficient Micro-Macro Approach to Finite Rubber Viscoelasticity", Fifth European Conference for Constitutive Models for Rubber (ECCMR), September 4-7, 2007, Paris, France.
- S. Göktepe: "Computational Modeling of Cardiac Electromechanics", Series of three lectures in Computational Mechanics of Materials and Structures (COMMAS) Summer School, October 6-10, 2008, Stuttgart, Germany.
- S. Göktepe: "Micro-Macro Approaches to Rubbery and Glassy Polymers: Predictive Micromechanically-Based Models and Simulations", Middle East Technical University (METU), Structural Mechanics Laboratory, October 20, 2008, Ankara, Turkey.
- S. Göktepe and E. Kuhl: "Electromechanics of Cardiac Tissue: A Unified Approach to the Fully Coupled Excitation-Contraction Problem" GAMM Annual Scientific Conference, February 9-13, 2009, Gdansk, Poland.