

MEHMET AYYILDIZ

İstanbul Bilgi University

Department of Mechatronics Engineering

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Research Interests

Computational and experimental continuum mechanics: mechanical characterization of soft biological tissues, constitutive modeling and numerical simulation of soft materials, finite element analysis; correlation between mechanical parameters and microstructural features of biological tissues: tactile imaging for detecting breast cancer, mechanics based pathology of liver; Haptics: tactile sensors and displays, haptic feedback on touchscreens, contact mechanics and frictional dynamics of the human finger pad in surface haptics, psychophysical evaluation of human haptic perception.

Education

09/2011 – 03/2015 **Koç University**

İstanbul, Turkey

Ph.D. in Mechanical Engineering (GPA: 4.00/4.00)

Thesis: Effects of preservation solution and period on the mechanical and histological properties of liver

Advisor: Prof. Dr. Çağatay Başdoğan

Committee: Prof. Dr. Edoardo Mazza (ETH Zurich)

Prof. Dr. Ingolf Sack (Charité Universitätsmedizin Berlin)

Assoc. Prof. Dr. Demircan Canadınç (Koç University)

Assoc. Prof. Dr. Burak Güçlü (Boğaziçi University)

Assist. Prof. Dr. Evren Samur (Boğaziçi University)

09/2009 – 07/2011 **Koç University**

İstanbul, Turkey

M.Sc. in Mechanical Engineering (GPA: 3.63/4.00)

Thesis: A novel opto-electro-mechanical tactile sensor for breast cancer imaging

Advisor: Prof. Dr. Çağatay Başdoğan

Committee: Assoc. Prof. Dr. Burak Güçlü (Boğaziçi University)

Assoc. Prof. Dr. Demircan Canadınç (Koç University)

09/2005 – 06/2009 **Selçuk University**

Konya, Turkey

B.Sc. in Mechanical Engineering (GPA: 3.37/4.00)

Employment

Academic Appointments

10/2016 – Present **İstanbul Bilgi University**

İstanbul, Turkey

Assistant Professor

09/2009 – 03/2015 **Koç University**

İstanbul, Turkey

Research and Teaching Assistant

Work Experience

- 01/2016 – 07/2016 **EnginSoft Turkey**
İstanbul, Turkey Technical Manager
- 05/2015 – 01/2016 **General Electric**
Gezbe, Turkey Design Engineer

Honors & Awards

- 2017 **İstanbul Bilgi University**
Teaching Excellence Award based on 2016-2017 Academic Year Spring Semester Course and Instructor Evaluation Survey (among top 10 instructors at the university)
- 2017 **İstanbul Bilgi University**
Teaching Excellence Award based on 2016-2017 Academic Year Fall Semester Course and Instructor Evaluation Survey (among top 10 instructors at the university)
- 2015 **Koç University**
Ranked 1st at the Graduate School of Sciences and Engineering (GPA: 4.00/4.00)
- 2011 – 2015 **Scientific and Technological Research Council of Turkey (TUBITAK)**
Scholarship for Ph.D. students - BIDEB 2211
- 2011 – 2015 **Koç University**
Full scholarship during Ph.D. studies
- 2010 – 2011 **Scientific and Technological Research Council of Turkey (TUBITAK)**
Scholarship for M.Sc. students - BIDEB 2210
- 2009 – 2011 **Koç University**
Full scholarship during M.Sc. studies
- 2009 **Selçuk University**
Ranked 2nd in the department (among ~120 students)
- 2008 **ERASMUS European Exchange Program**
Scholarship to study at Lublin University of Technology

Project Experience

- 2015 – 2016 **Methodology for optimum design of ship silencers**
Grant: Scientific & Technological Research Council of Turkey, Project No: 7150328
Role: Project Manager, EnginSoft Turkey
- 2011 – 2014 **The effect of preservation time of the viscoelastic material properties of liver**
Grant: Scientific & Technological Research Council of Turkey, Project No: 110M649
Role: Research Assistant, Koç University
- 2013 – 2014 **Dynamic mechanical properties and long term deformation behaviour of viscous materials (MeProVisc)**
Grant: The European Metrology Research Programme (EMRP)
Role: Research Assistant, Koç University

Publications

Peer Reviewed Journal Articles

- J.04* **M. Ayyildiz**, S. Cinoglu, C. Basdogan, "Effect of normal compression on the shear modulus of soft tissue in rheological measurements," *Journal of the Mechanical Behavior of Biomedical Materials*, vol. 49, pp. 235-243, Sep, 2015.
- J.03* **M. Ayyildiz**, R. G. Aktas, and C. Basdogan, "Effect of solution and post-mortem time on mechanical and histological properties of liver during cold preservation," *Biorheology*, vol. 51, no. 1, pp. 47-70, Jan, 2014.
- J.02* B. Yarpuzlu, **M. Ayyildiz**, O. E. Tok, R. G. Aktas, and C. Basdogan, "Correlation between the mechanical and histological properties of liver tissue," *Journal of the Mechanical Behavior of Biomedical Materials*, vol. 29, pp. 403-416, Jan, 2014.
- J.01* **M. Ayyildiz**, B. Guclu, M. Z. Yildiz, and C. Basdogan, "An optoelectromechanical tactile sensor for detection of breast lumps," *IEEE Transactions on Haptics*, vol. 6, no. 2, pp. 145-155, Apr-Jun, 2013.

Peer Reviewed Conference Proceedings

- P.05* A. Sagdic, **M. Ayyildiz**, and C. Basdogan, "Dokunmatik ekranlarda elektro-titreşim vasıtasıyla 2B eşkenar geometrik şekillerin dokunsal algılanışı," in *Proceedings of the 21th National Biomedical Engineering Meeting (BIYOMUT)*, Istanbul, Turkey, 2017 (to be appeared).
- P.04* O. Sirin, **M. Ayyildiz**, and C. Basdogan, "Parmak Hızının elektro-titreşim indüksiyonlu sürtünme kuvvetlerine etkisi," in *Proceedings of the 21th National Biomedical Engineering Meeting (BIYOMUT)*, Istanbul, Turkey, 2017 (to be appeared).
- P.03* **M. Ayyildiz**, B. Yarpuzlu, and C. Basdogan, "Saklama zamanının karaciğer dokusunun materyal özellikleri üzerindeki etkisi," in *Proceedings of the 17th National Biomedical Engineering Meeting (BIYOMUT)*, Istanbul, Turkey, 2012, pp. 19-25.
- P.02* **M. Ayyildiz**, B. Yarpuzlu, and C. Basdogan, "Karaciğer dokusunun saklama zamanına ve solüsyonuna bağlı materyal özelliklerinin değişimi," in *Proceedings of the 6st National Biomechanics Congress*, Sakarya, Turkey, 2012, pp. 41.
- P.01* **M. Ayyildiz**, B. Guclu, M. Z. Yildiz, and C. Basdogan, A novel tactile sensor for detecting lumps in breast tissue, in *Proceedings of EuroHaptics 2010 International Conference on Generating and Perceiving Tangible Sensations, Part I*, Amsterdam, Netherlands, 2010, pp. 367-372.

Peer Reviewed Conference Abstracts

- A.06* O. Sirin, **M. Ayyildiz**, and C. Basdogan, "Effect of Sliding Velocity on Frictional Forces Modulated by Electro-vibration," in *WIP of the 2017 World Haptics Conference, Munich, Germany*, 2017.
- A.05* A. Sadic, **M. Ayyildiz**, and C. Basdogan, "Haptic Perception of 2D Equilateral Geometric Shapes via Electro-vibration on Touch Screens," in *WIP of the 2017 World Haptics Conference, Munich, Germany*, 2017.
- A.04* E. Büyüktopçu, O. E. Tok, R. G. Aktas, B. Yarpuzlu, **M. Ayyildiz**, and C. Basdogan, "Organ nakilleri öncesi dokuların taşınma sürecinde UW ve Custodiol solüsyonlarında bekleyen karaciğer dokularında zamana bağlı ortaya çıkan değişikliklerin ince yapısal düzeyde incelenmesi," in *Abstracts of the 21st National Electron Microscopy Congress, Mersin, Turkey*, 2013.

- A.03 **M. Ayyildiz**, B. Yarpuzlu, and C. Basdogan, "The changes in mechanical properties of liver tissue during the cold ischemic preservation," in *Abstracts of the 5th International Conference on Mechanics of Biomaterials and Tissues (ICMOBT)*, Sitges, Spain, 2013.
- A.02 **M. Ayyildiz**, B. Yarpuzlu, and C. Basdogan, "Effect of preservation solution and period on rheological properties of liver," in *Abstracts of the 19th Congress of the European Society of Biomechanics (ESB)*, Patras, Greece, 2013.
- A.01 **M. Ayyildiz**, B. Yarpuzlu, and C. Basdogan, "A novel soft tissue slicing apparatus for preparing rheological samples," in *Abstracts of the 19th Congress of the European Society of Biomechanics (ESB)*, Patras, Greece, 2013.

Workshops, Demonstrations and Seminars

- W.05 **M. Ayyildiz**, "Biomechanical characterization and modeling of liver tissue," *İstanbul Neuroprosthetics Workshop, Boğaziçi University, İstanbul, Turkey, 2017.*
- W.04 **M. Ayyildiz**, "From mechanical properties to evaluation of transplant organs and detection of diseases: towards a mechanics based histology of soft tissue," *presented at İstanbul Bilgi University, İstanbul, Turkey, 2016.*
- W.03 **M. Ayyildiz**, "Soft Tissue Biomechanics," *presented at İstanbul Medipol University, İstanbul, Turkey, 2016.*
- W.02 S. Cinoglu, **M. Ayyildiz**, C. Basdogan, "Rheological experiments for the characterization of dynamic mechanical properties and long term deformation behaviour of viscous materials," *presented at MeProVisc Workshop - The Istituto Nazionale di Ricerca Metrologica (INRIM), Torino, Italy, 2014.*
- W.01 **M. Ayyildiz**, B. Guclu, M. Z. Yildiz, and C. Basdogan, "A Tactile Sensor for Detecting Lumps in Breast Tissue," *demonstrated at World Haptics Conference 2011, İstanbul, Turkey, 2011.*

Theses

- T.02 **M. Ayyildiz**, Effect of Preservation Solution and Period on the Mechanical and Histological Properties of Liver, Ph.D. Thesis, *Department of Mechanical Engineering, Koç University, March 2015.*
- T.01 **M. Ayyildiz**, A novel opto-electro-mechanical tactile sensor for breast cancer imaging, M.Sc. Thesis, *Department of Mechanical Engineering, Koç University, July 2011.*

Teaching

10/2016 – Present **Bilgi University**
İstanbul, Turkey Instructor

Course

MECA 491	Senior Design Project I
MECA 332	Mechatronics Components Design
MECA 321	Mechanics of Materials
MECA 241	Computer Tools for Mechatronics Engineers
MECA 211	Engineering Mechanics
MECA 205	Materials Science for Engineers
MECA 200	Summer Practice

Course

MECH 491 Mechanical Engineering Design
MECH 304 Dynamic Modeling and Control
MECH 303 Machine Design
MECH 302 Heat Transfer

Professional Activities

Reviewer for Journals

Medical Engineering & Physics
IEEE Transactions on Haptics
Journal of the Mechanical Behavior of Biomedical Materials
Journal of Biomechanics

Reviewer for Conferences

Worldhaptics
Eurohaptics
International Conference on Biomedical Engineering and Biotechnology
International Conference on Information Processing in Computer-Assisted Interventions

Member

European Society of Biomechanics
Technical Committee on Haptics

Other Activities

Managing Facebook and LinkedIn accounts for IEEE Transactions on Haptics

Certificates

- 2016 **Mechanical Design Fundamentals (MDF)**
General Electric
- 2015 **Jet Engine Tear Down School (JETS)**
General Electric
- 2015 **Fundamentals of GD&T per ASME Y14.5M-1994**
ETI
- 2011 **Basics of Rheometry - Oscillation eLearnig Diploma**
Anton Paar GmbH