## Dr. Mahmut Pekedis


**Contact Information**

Ege University
Department of Mechanical Engineering
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Izmir, Turkey

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**Research Interests**

**Solid mechanics:** structural health monitoring, biomechanics, numerical methods, the finite element analysis, meshless methods, damage detection, mechanics of composite materials, impact-crash analysis, in-silico modelling, elasticity theory, constitutive modelling, uncertainity quantification, validation and verification, clinical–experimental and numerical biomechanics, human-machine haptics interface, pattern recognation, machine learning, cyber physical systems, autonomous systems, robotics

**Current Academic Appointments**

**Associate Professor**, Ege University — August 2022 to present
Department of Mechanical Engineering (80%)
Product Lifecycle Management Research and Application Excellence Center (10%)
Mechatronics Engineering (10%)

**Previous Academic Appointments**

**Assistant Professor**, Ege University — April 2015 to August 2021
Department of Mechanical Engineering

**PhD Research Scholar**, Los Alamos National Laboratory — June 2012 to August 2013
Engineering Institute
- Supervisor: Dr. Charles Farrar and Dr. David Mascarenas
- A vibro-haptics human-machine interface for structural health monitoring

**Research/Teaching Assistant**, Ege University — September 2009 to June 2012
Department of Mechanical Engineering
- Supervisor: Professor Hasan Yildiz
- Structural health monitoring for composite structures

**Education**

Ph.D., Mechanical Engineering, Ege University, September 2014
- Thesis Topic: *Structural Health Monitoring and Maintanence System for Composite Materials*
- Adviser: Professor Hasan Yildiz
- Area of Study: Mechanical Engineering

M.S., Mechanical Engineering, Ege University, August 2008
- Thesis Topic: *Structural Analysis with Meshfree Methods*
- Adviser: Associate Professor Hasan Yildiz
- Area of Study: Mechanical Engineering

B.S., Mechanical Engineering, Gazi University, January 2006

**Refereed Journal Publications**

[1] Pekedis M, Ozan F.,Melez M. Location-dependent biomechanical characterization of the human Achilles tendon in diabetic and nondiabetic patients. *Journal of Biomechanical Engineering, Transactions of the ASME*, `Accepted for publication`, 2025.

[2] Pekedis M, Karaarslan AA, Ozan F., Tahta M., Kayali C. Novel anchor-type proximal femoral nail for the improvement of bone-fixation integrity in treating intertrochanteric fractures: an experimental and computational characterization study. *Computer Methods in Biomechanics and Biomedical Engineering*, 1-17.2025, doi:10.1080/10255842.2025.2456985

[3] Yegin ME., Pekedis M., Ates GS., Eroglu E., Uyanikgil Y., Ceylan N., Bilge O. Danger in the "shadows": rib cartilage histomechanics *Journal of Craniofacial Surgery*, , ***Accepted for publication***, 2025.

[4] Ozan F., Okur KT., Mavi F., Pekedis, M. Biomechanical and clinical assessment of dissociation in bipolar hip hemiarthroplasty. *Bio-Medical Materials and Engineering*, 0(0), 2025. doi:10.1177/09592989241306688

[5] Vahabi A., Pekedis M., Dastan AE., Yağmuroglu K, Yildiz O., Bilge O., Kaya H., Günay H. Comparative biomechanical and anatomical analysis of anchor, endobutton and tunnel methods in tibialis anterior tendon transfer fixation. *Ege Journal of Medicine*, 63 (4): 625-631, 2024. doi:10.19161/etd.1470834

[6] Ercan, E., Avcı, M.S., Pekedis, M., Hızal, Ç. Damage classification of a three-story aluminum building model by convolutional neural networks and the effect of scarce accelerometers. *Appl. Sci.*, 14:2568, 2024. doi:10.3390/app14062628

[7] Pekedis M., Altan M., Akgul T., Yildiz H. The influence of accessory rods and connectors on the quasi-static and dynamic response of spine fixation. *Experimental Techniques*, 47, 493–504, 2023. doi:10.1007/S40799-022-00569-2

[8] Pekedis M., Ozan F., Koyuncu S., Yildiz H. The finite element method-based pattern recognition approach for the classification of patient-specific gunshot injury. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, 236(5):665–675, 2022. doi:10.1177/09544119221086397

[9] Özden M.A., Acar E., Yildiz H., Güner M., Pekedis M. A vibro-haptics smart corset trainer for non-ideal sitting posture. *Textile and Apparel*, 32(4), 304 - 313, 2022. doi:10.32710/tekstilvekonfeksiyon.994444

[10] Pekedis M., Ozan F., Yildiz H. Biomechanics of the femoral head cartilage and subchondral trabecular bone in osteoporotic and osteopenic fractures. *Annals of Biomedical Engineering*, 49(12), 3388-3400, 2021. doi:10.1007/s10439-021-02861-5

[11] Pekedis M. Detection of multiple bolt loosening via data based statistical pattern recognition techniques. *Journal of the Faculty of Engineering and Architecture of Gazi University*, 36(4), 1993-2010, 2021. doi:10.17341/gazimmfd.820157

[12] Budak I.N., Pekedis M. Experimental and numerical fatigue behaviour analysis of a plastically deformed automobile tie rod. *Dokuz Eylul University Engineering Faculty Journal of Science and Engineering*, 23(68), 647-659, 2021. doi:10.21205/deufmd.2021236826

[13] Pekedis M., Yoruk M.D., Binboga E., Yildiz H., Bilge O., Çelik S. Characterization of the mechanical properties of human parietal bones preserved in modified larssen solution, formalin and as fresh frozen. *Surgical and Radiologic Anatomy*, 43(12), 1933-1943, 2021. doi:10.1007/s00276-021-02762-1

[14] Kabacaoglu S., Pekedis M., Yildiz H., Theoretical and experimental improvement of the effect of the diaphragm springs form used in the clutch system on the fatigue strength and mechanical characteristics. *Uludag University Journal of the Faculty of Engineering*, 26(3), 1121–1138, 2021. doi:10.17482/uumfd.939663

[15] Ayran E., Pekedis M. Validation of experimental impact tests on aluminum alloy car wheels using the finite element method. *DUJE*, 11(2), 663–670, 2020. doi:10.24012/dumf.651318

[16] Pekedis M. Damage diagnosis of bolt loosening via vector autoregressive - support vector machines.i *Hittite Journal of Science  Engineering*, 7(3), 169–179, 2020. doi:10.17350/HJSE19030000186

[17] Ozan F., Pekedis M., Koyuncu S., Altay T., Yildiz H., Kayali C. Micro-computed tomography and mechanical evaluation of trabecular bone structure in osteopenic and osteoporotic fractures. *Journal of Orthopaedic Surgery*, 25(1), 1–6, 2017. doi:10.1177/2309499017692718

[18] Pekedis M., Yildiz H. Damage diagnosis of a laminated composite beam and plate via model based structural health monitoring techniques. *Journal of the Faculty of Engineering and Architecture of Gazi University*, 31(4), 813–831, 2016. link

[19] Akdemir Ovunc, C Lineaweaver W., Cavusoglu T., Binboğa E., Uyanikgil Y., Zhang F., Pekedis M., Yagci T. Effect of taurine on rat Achilles tendon healing. *Connective Tissue Research*, 56(4), 300–306, 2015. doi:10.3109/03008207.2015.1026437

[20] Pekedis M., Masceranas D., Turan G., Ercan E., Farrar C.R, Yildiz H. Structural health monitoring for bolt loosening via a non invasive vibro haptics human machine cooperative interface. *Smart Materials and Structures*, 24(8), 85018, 2015. doi:10.1088/0964-1726/24/8/085018

[21] Pekedis M., Yildiz H. Numerical analysis of a projectile penetration into the human head via meshless method. *Journal of Mechanics in Medicine and Biology*, 14(04), 1450059, 2014. doi:10.1142/S0219519414500596

[22] Ozan F., Koyuncu S., Pekedis M., Altay T., Yildiz H., Toker G. Greater trochanteric fixation using a cable syste for partial hip arthroplasty: A clinical and finite element analysis. *BioMed Research International*, 1–7, 2014. doi:10.1155/2014/931537

[23] Olmez S., Dogan S., Pekedis M., Yildiz H. Biomechanical evaluation of sagittal maxillary internal distraction osteogenesis in unilateral cleft lip and palate patient and noncleft patients: A three-dimensional finite element analysis. *The Angle Orthodontist*, 84(5), 815–824, 2014. doi:10.2319/080613-586.1

[24] Atesci Y.Z., Aydogdu O., Karakose A., Pekedis M., Karal O., Senturk U., Cinar M. Does urinary bladder shape affecturinary flow rate in men with lower urinary tract symptoms?. *The Scientific World Journal*, 1–5, 2014. doi:10.1155/2014/846856

[25] Kuran F.D., Pekedis M., Yildiz H. ,Aydin F., Eliyatkin N. Effect of hyperbaric oxygen treatment on tendon healing after Achilles tendon repair: an experimental study on rats. *Acta Orthopaedica et Traumatologica Turcica*, 46(4), 293–300, 2012. doi:10.3944/AOTT.2012.2653

[26] Pekedis M., Yildiz H. Comparison of fatigue behaviour of eight different hip stems: a numerical and experimental study. *Journal of Biomedical Science and Engineering*, 4(10), 643–650, 2011. doi:10.4236/jbise.2011.410080

[27] Atesci Y.Z, Senturk U., Pekedis M., Cinar M. Non-invasive urodynamic analysis using the computational fluid dynamics method based on MR Images. *Turkiye Klinikleri Journal of Medical Sciences*, 31(5), 1186–1193, 2011. doi:10.5336/medsci.2010-21420

[28] Yegengil C., Pekedis M., Yildiz H. Fracture healing in a denervation and or nerve ending interpositioning model in the rat. *International Journal of Clinical Medicine*, 2(3), 301–306, 2011. doi:10.4236/ijcm.2011.23051

[29] Pekedis M., Yildiz H. Meshfree Methods and Their Classification. *Pamukkale University Journal of Engineering Sciences*, 2010, 16(1), 1–9.

[30] Ozan F., Yildiz H., Bora O.A, Pekedis M., Ay Coskun G., Gore O. The Effect Of Head Trauma On Fracture Healing: Biomechanical Testing And Finite Element Analysis. *Acta Orthopaedica Et Traumatologica Turcica*, 44(4), 313-321, 2010. 10.3944/Aott.2010.2277

[31] Pekedis M., Yildiz H. Modelling of axially loaded cantilever rod using element free Galerkin method. *Pamukkale University Journal of Engineering Sciences*, 15(3), 353–361, 2009.

[32] Pekedis M., Yildiz H. Solution of 2D cantilever beam by using the element free Galerkin method with the finite element method. *Sigma Journal of Engineering and Natural Sciences*, 27(1), 26–38, 2009.

## Refereed Conference Publications

[33] Aydin T., Pekedis M. Estimation of fatigue life of fasteners in different grades using vibration measurements *Hodja Akhmet Yassawi 8th International Congress on Scientific Research*, May 17-19, 2024, Konya, Turkey

[34] Avci M.S., Ercan E., Nuhoğlu A., Arisoy B., Hizal Ç., Pekedis M. Evaluating Damage Detection Performance in Reinforced Concrete Columns Using Synthetic Data and Machine Learning *5th International Engineering Research Symposium*, March 7-9, 2024, Duzce, Turkey.

[35] Avci M.S., Ercan E., Nuhoğlu A., Arisoy B., Hizal Ç., Pekedis M. Structural Damage Detection on Fire-Exposed Reinforced Concrete Columns Using Deep Learning: A Study with Acceleration Data *5th International Engineering Research Symposium*, March 7-9, 2024, Duzce, Turkey.

[36] Pekedis M. Uncertainity quantification of hyperelastic soft tissue. *26th Congress of the European Society of Biomechanics*, pp. 612, July 11–14, 2021. Milan, Italy.

[37] Pekedis M. Using Bayesian framework to calibrate Voce model parameters of ductile human parietal bone. *Biomechanics 2020*, pp. 119-120, September 9–10, 2021. Warsaw, Poland.

[38] Pekedis M. Biomechanical comparison of the osteoporotic and osteopenic trabecular bone specimens using modal analysis, 2021. *2nd International Congress on Engineering Sciences and Multidisciplinary Approaches*, pp. 325, September 18, 2021. Istanbul, Turkey.

[39] Yörük M.D., Pekedis M., Binboğa E., Çelik S., Bilge O. A comparison of biomechanical features modified Larssen fixed, 10% formalin fixed and fresh frozen cadavers. *National Anatomy Congress 1st International Mediterranean Anatomy Congress*, 12(2), September 6–9, 2018. Konya, Turkey.

[40] Pekedis M., Ozan F., Koyuncu Ş., Yildiz H., Application of the numerical method with machine learning algorithm for a 3D specific firearm injury forensic model. *23rd Congress of the European Society of Biomechanics*, July 2–5, 2017. Seville, Spain.

[41] Pekedis M., Masceranas D., Turan G., Ceylan H., Ercan E., Farrar C.R, Yildiz H. Structural health monitoring via human-machine Interface. *Sixth World Conference on Structural Control and Monitoring*, pp. 167–171, July 15–17, 2014. Barcelona, Spain.

[42] Ercan E., Pekedis M., Turan G., Ceylan H. Structural health monitoring with audio presentations *Sixth World Conference on Structural Control and Monitoring*, pp. 2643–2649, July 15–17, 2014. Barcelona, Spain.

[43] Ceylan H., Turan G., Ercan E., Pekedis M. Structural damage detection by using a single excitation record. *Sixth World Conference on Structural Control and Monitoring*, pp. 2567–2574, July 15–17, 2014. Barcelona, Spain.

[44] Mascarenas D.D.L., Choi YS., Kim H.C, Pekedis M., Hong S.C, Lee J.R, Farrar C.R. Development of a novel human-machine interface exploiting sensor substitution for structural health monitoring. *2013 IEEE RO-MAN: The 22nd IEEE International Symposium on Robot and Human Interactive Communication*, August 26–29, 2013. Gyeongju, South Korea. doi:10.1109/ROMAN.2013.6628482.

[45] Pekedis M., Yildiz H. Simulation of a projectile penetration to human head via meshless method. *The 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering*, April 3–4, 2013. Salt Lake City, Utah, USA.

[46] Mascarenas D., Choi Y.S, Kim H.C, Pekedis M., Yildiz H., Plont C., Brown C, Cowell M, Park G, Hahn H, Lee Jung-Ryul, Farrar C.R. A vibro-haptic human-machine interface for structural health monitoring. *9th International Workshop on Structural Health Monitoring (IWSHM)*, 2, pp. 1171-1178, September 10–12, 2013. San Francisco, CA, USA.

[47] Pekedis M., Yildiz H. Non-destructive damage detection of laminated composite beams based on dynamic analysis techniques. *9th International Fracture Conference*, pp. 114–124, September 19–21, 2011. Istanbul, Turkey.

[48] Pekedis M., Yildiz H., Comparison of dynamic fatigue behavior of eight different implanted hip prostheses during gait. *9th International Fracture Conference*, pp. 397–407, September 19–21, 2011. Istanbul, Turkey.

[49] Pekedis M., Ozan F., Yildiz H. Developing of a three-dimensional foot ankle model based on CT images and non-linear analysis of anterior drawer test by using the finite element method. *Fifth International Participated National Biomechanics Congress*, 44(1), pp. 14, September 23–25, 2010. Izmir, Turkey. doi:10.1016/j.jbiomech.2011.02.054

[50] Duran D., Kaya E., Pekedis M., Şentürk U., Erkek M., Yildiz H. Applications of numerical methods in biomechanics. *Fifth International Participated National Biomechanics Congress*, 44(1), pp. 14-15, September 23–25, 2010. Izmir, Turkey. doi:10.1016/j.jbiomech.2011.02.055

## Conference Posters

[51] Güner M., Yildiz H., Pekedis M., Acar E., Şekeroğlu S., Özden M.A. Improving a smart corset for posture defects. *Mas International Conference on Mathematics, Engineering, Natural Medical Science-VI*, pp. 69, July 12-14, 2019. Kiev, Ukraine.

[52] Pekedis M., Ölmez S., Doğan S., Yildiz H. Patient-specific 3D surgical simulation of distraction osteogenesis and lefort I osteotomy using the finite element method. *The 11th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering*, April 3–4, 2013. Salt Lake City, Utah, USA.2013.

[53] Ölmez S., Doğan S., Pekedis M., Yildiz H. The evaluation of maxillary advancement technique using internal distraction osteogenesis in unilateral cleft lip and palate patient with finite element analysis. *Fifth International Participated National Biomechanics Congress*, 44(1), 13-14, September 23–25, 2010. Izmir, Turkey. doi:10.1016/j.jbiomech.2011.02.053

[54] Pekedis M., Yildiz H. Finite element analysis of the anterior drawer test for foot ankle. *European Biotechnology Congress 2011*, 22(1), 150-151, September 28–October 1, 2011. Istanbul, Turkey. *10.1016/j.copbio.2011.05.502*,

[55] Ölmez S., Doğan S., Pekedis M., Yildiz H. Biomechanical analysis of sagittal maxillary advancement using internal maxillary distractors. *87th Congress of the European Orthodontıc socıety*, June 19–23, 2011. Istanbul, Turkey.

[56] Ölmez S., Doğan S., Pekedis M., Yildiz H. Biomechanical effects of maxillary advancement on the craniofacial skeleton with unilateral cleft lip and p alate, using internal maxillary distractors. *9 th European Craniofacial Congress*, September 14–17, 2011. Salzburg, Istanbul, Austria.

[57] Pekedis M., Ozan F., Dinç M.H., Yildiz H. Investigation of the effects of allogeneic mesenchymal stem cells on bone union and regeneration in the necrosed bone by biomechanical test and the finite element method. *Fifth International Participated National Biomechanics Congress*, 44(1), 15, September 23–25, 2010. Izmir, Turkey. doi:10.1016/j.jbiomech.2011.02.056

## Book Chapters

[58] Ozden MA., Pekedis M. Handbook of Aviation Technology and its Applications. In: C. Harmansah, H.T. Hava, *Real-time structural health monitoring using ultrasonic wave scatterers*. pp. 163–172, 2022.

## Other Publications

[59] Pekedis M. *Structural Health Monitoring and Maintanence System for Composite Materials*. PhD thesis, Ege University, Bornova, Izmir, Turkey, 2014.

[60] Pekedis M. *Structural Analysis with Meshfree Methods*. Master's thesis, Ege University, Bornova, Izmir, Turkey, 2008

## Grants

[1] Pekedis M., Ozan F., Unlu ÖC. Development of a graphical user interface based on coupled in vitro measurements and in silico modeling for the elastic-plastic biomechanical characterization of trabecular bone. August 16, 2023 to August 16, 2025.

[2] Hızal, H., Nuhoglu, A., Ercan E., Pekedis M., Avci MS Modal Parameter Determination Based on Probabilistic Distribution of Frequency Response Function. Council of Higher Education – Ege University Office of Scientific Research Projects, February 27, 2024 to February 27, 2025.

[3] Sarikanat M., İşbilir A., Gürses B.O, Uzunbayır B., Tümer D., Yildiz H., Yilmazkarasu H., Çetin L., Altay L., Pekedis M., Şener M., Boztepe M., Kaya T.Z, Seki Y. Development of Piezoelectric Polymeric Metamaterials for Space and Satellite Technologies using Additive Manufacturing Technologies. Council of Higher Education – Ege University Office of Scientific Research Projects, February 1, 2023 to February 1, 2026.

[4] Ercan E., Nuhoğlu A., Arisoy B., Arisoy B., Hizal Ç., Pekedis M., Avci M.S. Experimental and Numerical Evaluation of the Performance of Steel Composite Elements Embedded in Fired Concretes Subjected to Combined Flexural Loads. Ege University Office of Scientific Research Projects, February 1, 2023 to February 1, 2024.

[5] Yüce M.Ö, Koyuncu B.Ö., Tümer D., Gökçe F.M, Pekedis M. The Influences of Roots Left in the Mandible After Coronectomy on Mandible Fragility. Ege University Office of Scientific Research Projects, June 33, 2022 to June 24, 2024.

[6] Ozkol M.Z, Yildiz H., Biçer M.E.K, Pekedis M. Design, Manufacture and Anaerobic Performance Testing of an Adjustable Q-Factor Cycling Prototype. The Scientific and Technological Research Council of Turkey (TUBITAK 1001), August 1, 2022 to August 1, 2024.

[7] Yildiz H., Pekedis M., Pekbey Y., Unal H.Y. Improvement of Mechanical Properties of Composite Plates via Optimized Nanoclay Additions. Ege University Office of Scientific Research Projects, June 29, 2017 to January 1, 2021.

[8] Pekedis M., Sayer S., Yildiz H. Development of a Human-Machine Haptics Interface for Product Life-Cycle Management (PLM) Applications. Ege University Office of Scientific Research Projects, June 29, 2017 to December 3, 2020.

[9] Yildiz H., Sayer S., Pekedis M.,Turan M., Unal H.Y, Gurses B.O. Optimization of a Laptop Chassis using Inverse Techniques for the Product Life-Cycle Management (PLM) Applications. Ege University Office of Scientific Research Projects. June 7, 2016 to January 1, 2019.

[10] Guner M., Yildiz H., Pekedis M. Devolopment of a Smart Corset for Non-Ideal Sitting posture defects. The Scientific and Technological Research Council of Turkey (TUBITAK 1005), January 15, 2018 to July 14, 2019.

[11] Turan M., Ünal H.Y, Yildiz H., Pekedis M.,Sayer S. Improvement of Services in a Department within the University: PLM Implementation. Ege University Office of Scientific Research Projects, February 27, 2018 to August 27, 2022.

[12] Yildiz H., Pekedis M. Modeling of the Delamination in Composite structures with Piezoelectric Materials. Ege University Office of Scientific Research Projects, June 4, 2012 to June 18, 2015.

[13] Pekedis M, Yildiz H. A Human-machine Interface for Localizing Ultrasonic Scatterers for structural health monitoring. Ege University Office of Scientific Research Projects, October 10, 2012 to December 12, 2013.

[14] Sarikanat M, Yildiz H., Baltaci A., Pekedis M, Erden S. Production, Improvement and Characterization of Natural Fiber Reinforced Polymer Composites. Ege University Office of Scientific Research Projects, April 20, 2009 to February, 2012.

## Professional Service

**Referee Service**

1. *Measurement Science and Technology*, 2025
2. *The Spine Journal*, 2025
3. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, 2024
4. *Uludag University Journal of the Faculty of Engineering*, 2024
5. *Measurement Science and Technology*, 2024
6. *Textile and Apparel*, 2024
7. *The Spine Journal*, 2024
8. *Textile and Apparel*, 2024

9. *Frontiers in Surgery*, 2024
10. *Smart Materials and Structures*, 2024
11. *Nature Scientific Reports*, 2024
12. *Prosthetics  Orthotics International*, 2024
13. *Annals of Biomedical Engineering*, 2024
14. *Smart Materials and Structures*, 2023
15. *Nature Scientific Reports*, 2023
16. *Textile and Apparel*, 2023
17. *Smart Materials and Structures*, 2023
18. *Textile and Apparel*, 2023
19. *Computer Methods in Biomechanics and Biomedical Engineering*, 2022
20. *Prosthetics  Orthotics International*, 2022
21. *Frontiers in Psychiatry*, 2022
22. *Annals of Biomedical Engineering*, 2022
23. *Sigma Journal of Engineering and Natural Sciences*, 2022
24. *Prosthetics  Orthotics International*, 2022
25. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, 2022
26. *Journal of Interdisciplinary Innovation Studies*, 2021
27. *Uludag University Journal of the Faculty of Engineering*, 2021
28. *Journal of the Faculty of Engineering and Architecture of Gazi University*, 2020
29. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, 2019
30. *Mechanical Systems and Signal Processing*, 2019
31. *Histology and Histopathology*, 2018
32. *Computers in Biology and Medicine*, 2017
33. *Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine*, 2015
34. *Smart Materials and Structures*, 2015
35. *Turkish journal of engineering  environmental sciences*, 2012
36. *Journal of Tissue Engineering and Regenerative Medicine*, 2010

## Advising and Mentoring

**Graduate Students**

- **Schirin Schirinova**, PhD Student, Mechanical Engineering, 2024–
- **Mert Narin**, PhD Student, Mechanical Engineering, 2024–
- **Saran Sapmaz**, PhD Student, Mechanical Engineering, 2023–
- **Tarık Turgut**, MS Student, Product Lifecycle Management, 2024–
- **Yücel Temel**, MS Student, Mechanical Engineering, 2023–
- **Murat İşler**, MS Student, Mechanical Engineering, 2023–
- **Anil Çelik**, MS Student, Mechanical Engineering, 2022–
- **Ali Düdük**, MS Student, Mechanical Engineering, 2018–
- **Tolga Aydın**, MS Student, Mechanical Engineering.
  Thesis topic:Estimation of fatigue life of fasteners in different grades, 2021–2024 (graduated, MS)
- **Schirin Schirinova**, MS Student, Mechanical Engineering.
  Thesis topic:Design of a tension-compression device for the biomechanical characterization of soft tissue, 2021–2024 (graduated, MS)
- **Mert Narin**, MS Student, Mechanical Engineering.
  Thesis topic: Hip prosthesis design with a shock absorber, 2021–2024 (graduated, MS)
- **Saran Sapmaz**, MS Student, Mechatronics Engineering.
  Thesis topic: Computer vision and sensor based autonomous mobile robot for simultaneous localization and mapping. 2020–2023 (graduated, MS)
- **Mehmet Arda Ozden**, MS Student, Mechanical Engineering.
  Thesis topic: A human-machine auditory interface for structural health monitoring 2018–2021 (graduated, MS)
- **Emrah Ayran**, MS Student, Mechanical Engineering.
  Thesis topic: Validation of experimental impact tests on aluminum alloy car wheels using the finite element method. 2016–2019 (graduated, MS)
- **Isin Naz Budak**, MS Student, Mechanical Engineering.
  Thesis topic: Experimental and numerical fatigue behavior analysis of a plastically deformed passenger car tie rod. 2016–2019 (graduated, MS)

## Teaching Experience

**Ege University**, Izmir, Turkey

*Instructor* **Fall 2015 to present**

- Statics
- Dynamics
- Mechanics of Materials
- Computational Mechanics
- Elasticity Theory (Graduate-level course)

*Instructor* **Fall 2019 to present**

- Virtual product development principles (Graduate-level course)

## Professional Experience

**Ege University, Izmir, Turkey**

*Associate Professor* **August 2022**

Joint Appointment:
- Department of Mechanical Engineering
- Product Lifecycle Management Research and Application Excellence Center

*Assistant Professor* **April 2015 to August 2022**
Department of Mechanical Engineering
- Devoloped a model based structural health monitoring technique to detect the damage in composite materials
- Implemented data based structural health monitoring approaches to detect nonlinearities in engineering systems
- Initiated a project for exploring the use of ultrasonic-wave propagation measurements coupled with non-invasive, vibro-tactors to develop a structural health monitoring-human machine interface.
- Performed a research to develop, test and validate a meshless smoothed particle hydrodynamic framework for the analysis of hard tissue failure.
- completed a research with orthopaedicians to investigate the biomechanics of the femoral head cartilage and subchondral trabecular bone in osteoporotic and osteopenic fractures
- Chosen to deliver lecturers and prepare course materials for undergraduate courses such as Elasticity theory, Mechanics of materials and Statics
- Supervision of graduate and undergraduate students in mechanical, biomedical and mechatronics engineering.

*Research/Teaching Assistant* **September 2009 to July 2012**
Department of Mechanical Engineering

Supervisor: Professor Hasan Yildiz
- Developed an algorithm based on modal shapes for detecting and repairing the crack damage in laminated composite beams.
- Support vector machines (SVM) a machine learning algorithm has been applied to detect the presence of damage in a tower structure.
- Submitted the results of MS dissertation to scientific journals.
- Assisted some undergraduate courses such as the finite element method, mechanics of composite materials, strength of materials and statics.

**Los Alamos National Laboratory, NM, USA**

*PhD Research Scholar* **June 2012 to August 2013**
Engineering Institute

Supervisor: Dr. Charles Farrar and Dr. David Mascarenas
- Developed a novel human-machine cooperative paradigm for structural health monitoring applications.
- The paradigm includes multidisciplinary fields such as human nervous system, structural health monitoring (SHM) sensor networks, IoT networks, signal processing techniques, feature extractions methods, cyber-physical systems, multivariate statistical methods, psychophysics procedures and h aptics technology to create harmonies among human and machine.

**STFA, Itanbul, Turkey**

*Maintenance Engineer* **December 2007 to August 2008**
- Devoloped computer based fault diagnosis tools to determine the damages in construction equipments.

## Professional Memberships

European Society of Biomechanics, Member, 2017–present

| | |
|---|---|
| Other Meeting Attendance | **Participant**<br>Raising Awareness on Product Lifecycle Management via Education and Industrial Strategic Collaboration within Europe, July 11 – July 15, 2016, Kaiserslautern, Germany. |
| Service | Ege University, Department of Mechanical Engineering<br>*Vice Chair*, **2021 to 2022** |
| Application Areas | Autonomous and Unmanned Vehicles, Mechanical Systems, Engineering Structures, Flexible Manufacturing Systems, Biomedical Technologies |
| Hardware and Software Skills | Computer-Aided Design Tools:<br>• AutoCad, SolidWorks, Shapr3D, SpaceClaim, FreeCAD<br>Computer-Aided Engineering Tools:<br>• Abaqus/Implicit, Abaqus/Explicit, FEBio, HyperWorks, HyperMesh, Ansys, CalculiX<br>Embedded and Real-time Systems:<br>• Software and hardware development with several MCU (e.g., Atmel ATmega MCU's, STM MCU's and others)<br>Instrumentation, Control, Data Acquisition, Test, and Measurement:<br>• LabVIEW and other National Instruments control and data acquisition hardware and software (PicoScope, Hewlett-Packard, Agilent, PI (Physik Instrumente), Keysight, Tektronix equipments)<br>Computer Programming:<br>• C, Python, Fortran, Visual Basic (.NET) and others<br>Numerical Analysis:<br>• Matlab, Python Scipy–NumPy<br>Matlab skill set:<br>• Linear algebra, symbolic math, Fourier transforms, Monte Carlo analysis, nonlinear numerical methods, polynomials, signal processing, visualization, machine learning<br>• Toolboxes: communications, control system, filter design, statistics and machine learning, symbolic, econometrics<br>Python skill set:<br>• Linear algebra, Symbolic math, Fourier transforms, Bayesian optimization, Classification, Sensitivity Analysis, Nonlinear numerical methods, Signal processing, Machine learning, Visualization<br>• Modules: PyQt5, Qtgraph, Scipy, SymPy, NumPy, Tensorflow, PyTorch, BoTorch, Scikit-optimize, Statsmodels, Seaborn, Arviz, Pandas and others<br>Information/Internet Technology:<br>• Networking (UDP, TCP), Data application and dashboard (Streamlit), Web framework (FastAPI)<br>Desktop Editing and Productivity Software:<br>• Eclipse, Jupyter, Spyder, PyCharm<br>• TEX (LATEX),<br>• Microsoft Office, OpenOffice.org, LibreOffice,<br>• InkScape<br>Operating Systems:<br>• Microsoft Windows family, Mac OS X, Ubuntu and other Linux variants |

Awards

Council of Higher Education
- Graduate Research Fellowship, 2012–2013

Ege University
- Research Fellowship, 2012–2014