28.06.2018

Dr. Ergin Tönük 2018-2019 Possible Graduate Thesis Topics

1. Instrumented medical device design and prototype production: In many medical and surgical devices the force/torque applied by the device is estimated by the user without any measurement. In this thesis accurate measurement of force/torque applied by the medical device would be achieved by a custom design strain gauge based sensor, M. S. Listed under *Biomechanics, Solid Mechanics, Design.*
2. Soft biological tissue testing and non-integer viscoelastic constitutive modeling using inverse finite element techniques, implementation of in-plane anisotropy, M.S. or Ph. D. Listed under *Biomechanics, Solid Mechanics, Computational Mechanics.*
3. IMU-based gait analysis system, data acquisition and biomechanical modelling using OpenSim, M.S. Listed under *Biomechanics, Dynamics.*
4. Orthopedic biomechanics (e.g. surgery planning based on mechanical considerations) and/or human joint modeling (e.g. hip, knee, ankle, shoulder, elbow, wrist etc.). You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. or Ph. D. Listed under *Biomechanics, Solid Mechanics, Dynamics.*
5. Mechanical analysis, design or optimization of orthopedic implants. You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. Listed under *Biomechanics, Solid Mechanics, Design.*
6. Mechanical analysis, design or optimization of dental implants and prosthesis. You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. Listed under *Biomechanics, Solid Mechanics, Design.*
7. Testing and modeling rubber and/or polymer materials by non-integer order viscoelastic constitutive material model (only for students working in rubber or polymer industry, in collaboration with company), M.S. or Ph. D. Listed under *Biomechanics, Solid Mechanics, Computational Mechanics.*
8. Mechanism design and analysis (only for students working in a company that agrees to cooperate and is in need of such a design), M.S. Listed under *Mechanisms.*
9. Rail vehicle component analysis and/or design or optimization (only for students working in a company that agrees to cooperate or TCDD and is in need of such a research), M.S. Listed under *Design, Computational Mechanics.*
10. Experimental investigation and computer modeling of biomechanical models for crashworthiness. The experimental part of this thesis will be conducted at ODTÜ-BİLTİR Vehicle Safety Unit with the co-supervision of Prof. Dr. Mustafa İ. Gökler. M.S. or Ph. D. Listed under *Biomechanics, Solid Mechanics, Design, Computational Mechanics, Vehicle Safety.*