

CURRICULUM VITAE

Murat Demiral

Associate Professor
Mechanical Engineering
Çankaya University

CONTACT INFORMATION

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EDUCATION

2009 Dec - 2012 Dec **PhD in Mechanical & Manufacturing Engineering, Loughborough University, UK**
PhD Thesis: Enhanced gradient crystal plasticity study of size effects in b.c.c. metal

2005 Sep - 2007 Oct **MSc in Computational Mechanics, Technical University of Munich, GERMANY**
MSc Thesis: Solution of dynamic equilibrium equations using numerical time integration schemes
CGPA: 2.1 (Honour)

2001 Sep - 2005 Jun **BSc in Mechanical Engineering, Middle East Technical University, TURKEY**
CGPA: 3.43/4.00 (Honour)

EMPLOYMENT HISTORY

2017 Jan to now Associate Professor Çankaya University

2016 Apr to 2016 Dec Associate Professor University of Turkish Aeronautical Association

2014 Aug to 2016 Mar Assistant Professor University of Turkish Aeronautical Association

2013 Apr to 2014 Jul Research Associate KAUST, Saudi Arabia
Full-time Post-doctoral Research Associate working on the project funded by KAUST baseline fund

2012 Sep to 2013 Feb Research Associate Loughborough University, UK
Full-time Post-doctoral Research Associate working on the project funded by EPSRC (in collaboration with University of Edinburgh, University of Glasgow and Mectron Medical) “Multi-scale Modelling of Bone Cutting” at Wolfson School of Mechanical and Manufacturing Engineering

2009 Oct to 2012 Aug Research Associate Loughborough University, UK
Full-time Research Associate working on the project funded by the European Commission (EC) “Macro, Micro and Nano Aspects of Machining (MAMINA)” at Wolfson School of Mechanical and Manufacturing Engineering

2007 Dec to 2009 Aug Simulation Engineer ISKO Engineering AG, GERMANY
Full-time Simulation Engineer working on different projects:
• Linear and nonlinear FEM modelling and structural analyses
• Crash analysis, dummy modelling and safety performance projects in cooperation with BMW Group and AUDI AG

2007 Apr – 2007 Oct Research Student ISKO Engineering AG, GERMANY
• Numerical simulation of airbag explosion and crash analysis

2006 Feb – 2006 Oct Simulation Engineer Neuner+Graf IG, GERMANY
• Static and dynamic analyses of Düsseldorf Sky Train railroad

PUBLICATIONS

1. **M. Demiral**, A. Roy, V.V. Silberschmidt. Effects of Loading Conditions on Deformation Process in Indentation, *Computers, Materials & Continua*, Vol. 19 (2), pp. 199-216, 2010. **SCI-E**
2. **M. Demiral**, A. Roy, V.V. Silberschmidt. Finite element simulation of ultrasonically-assisted turning of Ti-15-333, *2nd MAMINA conference in proceedings of the 20th international workshop on computational mechanics of materials (IWCMM20)*, Loughborough, UK, pp. 7-17, 2010.
3. **M. Demiral**, N. Ahmed, A. Roy, V.V. Silberschmidt. Mechanics of material removal process in ultrasonically assisted cutting: Advanced finite element Study, *Proceedings of the 4th CIRP International Conference on High Performance Cutting*, Gifu, Japan, Vol. 2, pp. 43-48, 2010.
4. **M. Demiral**, A. Roy, V. Silberschmidt. Repetitive indentation of Ti-based alloys: A numerical study, *IOP Conf. Series: Materials Science and Engineering* 10, 2010.
5. **M. Demiral**. Comparison of implicit time integration schemes for nonlinear dynamic problems, *ASME Conference Proceedings*, pp. 165-170, 2010.
6. **M. Demiral**, A. Roy, V.V. Silberschmidt. Dynamic behaviour of advanced Ti alloy under impact loading: Experimental and numerical analysis, *Applied Mechanics and Materials*, Vol. 70, pp. 207-212, 2011.
7. **M. Demiral**, T. Leemet, M. Hokka, V. T. Kuokkala, A. Roy, V.V. Silberschmidt. Finite-element simulations of split Hopkinson test of Ti-based alloy, *Advanced Materials Research*, Vol. 223, pp. 296-303, 2011.
8. R. Muhammad, N. Ahmed, **M. Demiral**, A. Roy, V.V. Silberschmidt. Computational Study of Ultrasonically-Assisted Turning of Ti alloys, *Advanced Materials Research*, Vol. 223, pp. 30-36, 2011.
9. A. Zahedi, **M. Demiral**, A. Roy, V. Babitsky, V.V. Silberschmidt. Indentation in f.c.c. single crystals, *Solid State Phenomena*, Vol. 118, pp. 219-225, 2012.
10. **M. Demiral**, A. Roy, V. Silberschmidt. Deformation processes of advanced alloy in indentation and turning, *Computers, Materials & Continua*, Vol. 31 (3), pp. 157-172, 2012. **SCI-E**
11. A. Zahedi, **M. Demiral**, A. Roy, V. Silberschmidt. FE/SPH modelling of orthogonal micro-machining of f.c.c. single crystal. *Computational Materials Science*, Vol. 78, pp. 104-109, 2013. **SCI**
12. **M. Demiral**, A. Roy, V. Silberschmidt. Indentation studies in b.c.c. crystals with enhanced model of strain gradient crystal plasticity. *Computational Materials Science*, Vol. 79, pp. 896-902, 2013. **SCI**
13. R. Muhammad, **M. Demiral**, A. Roy, V.V. Silberschmidt. Modelling the dynamic behaviour of hard-to-cut alloys under conditions of vibro-impact cutting, *Journal of Physics: Conference Series*, vol. 451(1), pp. 012030, IOP Publishing, 2013.
14. R. Muhammad, A. Maurotto, **M. Demiral**, A. Roy, V.V. Silberschmidt. Thermally enhanced ultrasonically assisted machining of Ti alloy, *CIRP Journal of Manufacturing Science and Technology*, Vol. 7(2), pp. 159-167, 2014. **SCI**
15. **M. Demiral**, A. Roy, T. El Sayed, V.V. Silberschmidt. Influence of strain gradients on lattice rotations in nano-indentation experiments, *Materials Science and Engineering A*, Vol. 608, pp. 73-81, 2014. **SCI**
16. **M. Demiral**, A. Roy, T. El Sayed, V.V. Silberschmidt. Numerical modelling of micro-machining of f.c.c. single crystal: Influence of strain gradients, *Computational Materials Science*, Vol. 94, pp. 273-278, 2014 **SCI**

17. **M. Demiral**. SPH modelling of vibro-assisted turning of Ti alloy: Influence of vibration parameters, *Journal of vibroengineering*, 2014. **SCI-E**
18. L. Jinxing, **M. Demiral**, T. El Sayed. Taylor-plasticity-based analysis of length-scale effects in void growth, *Modelling and Simulation in Materials Science and Engineering* 22, no. 7: 075005, 2014. **SCI**
19. **M. Demiral**, A.A. Abdel-Wahab, V.V. Silberschmidt. A numerical study on indentation properties of cortical bone tissue: Influence of anisotropy, *Acta of Bioengineering and Biomechanics*, Vol. 17(2), 2015. **SCI-E**
20. **M. Demiral**, A. Roy, V.V. Silberschmidt. Strain-gradient crystal-plasticity modelling of micro-cutting of b.c.c. single crystal, *Meccanica*, Vol.. 51(2), pp. 371-381, 2016. **SCI**
21. **M. Demiral**, K. Nowag, A. Roy, R. Ghisleni, J. Michler, V.V. Silberschmidt. Enhanced gradient crystal plasticity study of size effects in a β -titanium alloy, *Modelling and Simulation in Materials Science and Engineering* (Accepted, <http://iopscience.iop.org/article/10.1088/1361-651X/aa5ce3>), 2017. **SCI**
22. U. Asim, M.A. Siddiq, **M. Demiral**. Void growth in high strength aluminium alloy single crystals - A CPFEM based study, *Modelling and Simulation in Materials Science and Engineering* (Accepted, <http://iopscience.iop.org/article/10.1088/1361-651X/aa5bcc>), 2017. **SCI**

CONFERENCES

- **M. Demiral**, A. Roy, V.V. Silberschmidt, Effects of strain gradients on texture evolution in nano-indentation experiments: A numerical Study, *3rd International Workshop on Physics Based Material Models and Experimental Observations*, Cesme-Izmir, Turkey, 2-4 Jun 2014.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Finite element modelling of micro-machining process, *4th APMAS conference*, Dalaman-Muğla, Turkey, 24-27 Apr 2014.
- **M. Demiral**, A. Zahedi, T. El Sayed, A. Roy, V.V. Silberschmidt, Numerical modelling of micro-machining of f.c.c. single crystal: Influence of strain gradients, *21th International Workshop on Computational Mechanics of Materials (IWCMM23)*, National University of Singapore, SINGAPORE, 2-4 Oct 2013.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Deformation mechanisms in advanced Ti-based alloy in indentation: Size effects, *10th world congress on Computational Mechanics (WCCM 2012)*, Sao Paulo, BRAZIL, 8-13 July 2012.
- A. Zahedi, **M. Demiral**, A. Roy, V. Babitsky, V.V. Silberschmidt. Indentation in f.c.c. single crystals, *Advanced Materials and Structures 2011 (AMS'11)*, Timisoara, ROMANIA, 27-28 October 2011.
- **M. Demiral**, A. Roy, V.V. Silberschmidt. Dynamic behaviour of advanced Ti alloy under impact loading: Experimental and numerical analysis, *8th International Conference on Advances in Experimental Mechanics: Integrating Simulation and Experimentation for Validation (BSSM 2011)*, Edinburgh, SCOTLAND, 7-9 September 2011.
- **M. Demiral**, A. Zahedi, A. Roy, V. V. Silberschmidt, Deformation mechanisms of advanced Ti-based alloy in nano-scale: A numerical study based on experiments, *2nd International Conference on Material Modelling (2nd ICMM)*, Paris, FRANCE, 31 August - 2 September 2011.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Deformation mechanisms of an advanced Ti-based alloy in indentation, *21th International Workshop on Computational Mechanics of Materials (IWCMM21)*, Limerick, IRELAND, 21-24 August 2011.

- **M. Demiral**, T. Leemet, M. Hokka, V. T. Kuokkala, A. Roy, V.V. Silberschmidt, Numerical analysis of split Hopkinson pressure bar experiment, *13th CIRP Conference on Modelling of Machining operations*, Sintra, PORTUGAL, 12-13 May 2011.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Deformation mechanisms of Ti-alloy in instrument-workpiece interaction: Dynamic and kinematic aspects, *International Conference on Computational & Experimental Engineering & Sciences 2011 (ICCES'11)*, Nanjing, CHINA, 18-21 April 2011.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Mechanics of material removal process in ultrasonically assisted cutting: Advanced finite element Study, *4th CIRP International Conference on High Performance Cutting*, Gifu, JAPAN, 24-26 October 2010.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Finite element simulation of ultrasonically-assisted turning of a Ti-based alloy, *20th International Workshop on Computational Mechanics of Materials (IWCM20)*, Loughborough, UK, 8-10 September 2010.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Deformation mechanisms in advanced Ti-based alloy in indentation: Size effects, *9th world congress on Computational Mechanics (WCCM 2010)*, Sydney, AUSTRALIA, 19-23 July 2010.
- **M. Demiral**, Comparison of implicit time integration schemes for nonlinear dynamic problems, *ASME 2010 10th Biennial Conference on Engineering Systems Design and Analysis (ESDA 2010)*, Istanbul, TURKEY, 12-14 July 2010.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Advanced numerical study on the ultrasonically-assisted machining, *International Conference on Computational & Experimental Engineering & Sciences 2010 (ICCES'10)*, Las Vegas, USA, 28 March-1 April 2010.

COURSES TAUGHT

Undergraduate

(2014-2016) Manufacturing Techniques

(2014-2016) Strength of Materials

(2014-2015) Materials Science and Manufacturing Techniques

(2014-2016) Materials Science and Engineering

(2016-2017) Advanced Strength of Materials

Post Graduate

(2014-2015) Yapısal Analizlerde Modelleme ve Simülasyon (in Turkish)

(2014-2015) Modelling and Simulation in Structural Analysis

(2014-2015) Sonlu Elemanlar Yöntemi (in Turkish)

(2014-2015) Finite Element Method

COURSES AND WORKSHOPS

2011

Micro-mechanics of Materials, Swiss Federal Lab. for Materials Testing and Research, SWITZERLAND

Nickel-base Superalloys, Alstom Switzerland Ltd., SWITZERLAND

Engineering Management and Business Studies, Loughborough University, UK

2010

European Projects / European Patents, Technical University of Braunschweig, GERMANY

Progressive Cutting Methods, Loughborough University, UK

Dynamic Material Behaviour and High Strain Rate Testing, Tampere University of Technology, FINLAND

Introduction to Computer Simulation of Alloys, National e-Science Centre in Edinburgh, SCOTLAND

Acting Professionally in Teams, Volkswagen AG, Wolfsburg, GERMANY

Scientific Presentations and Networked Collaboration, Technical University of Braunschweig, GERMANY

2007

Multi-scale Characterization and Modelling of Materials, Technical University of Munich, GERMANY and St. Petersburg State University, RUSSIA

2006

Crash Analysis and Car Dynamics, Paris Institute of Technology, FRANCE

Numerical optimization and form finding realization of a membrane structure, Technical University of Munich, GERMANY

SKILLS

I have the following skills and experiences that can be carried forwards:

- IT programming skills: C, C++, Fortran, Visual Basic, Maple, Mathcad, High performance clusters, Linux
- Experienced in multi-physics simulation programs: MSC.Marc, Adina, Abaqus with user defined subroutines (UMAT, VUMAT and URDFIL), Ansys, Ansys CFX, Patran, Nastran, Pamcrash, Animator
- Command of CAD programs: Catia V5, Autodesk/AutoCAD, Ansa
- Experienced in material characterization experiments: tensile testing (creep & relaxation), hardness testing (micro & nano indentation), impact testing, electron backscatter diffraction technique, ultrasonically assisted machining
- Referencing tools: Endnote, RefWorks
- Language skills: Turkish (Native), English (Advanced), German(Advanced)

ESTEEM, HONOURS AND AWARDS

- Referee for

Materials Research Express

Ultrasonics

European Journal of Mechanics - A/Solids

Shock and Vibration

Journal of Vibration and Control

Journal of Micromechanics and Microengineering

Journal of Applied Mechanics

Transactions of ASME

Journal of Physics: Conference Series

Agronomy Research

Smart Materials and Structures

- Full scholarship from Loughborough University, UK and KAUST, SA for PhD and Post-Doc studies, respectively
- Research fund from the European Commission (EC) for the project called “Macro, Micro and Nano Aspects of Machining (MAMINA)”

- Incentive Grant from TUBITAK (The Scientific and Technological Research Council of Turkey) for International Scientific Publication
- TUBITAK 2232 Research Grant
- Research Grant (800000 USD) from National Defence Ministry for the “National Helicopter Project”