

# CURRICULUM VITAE

## Murat Demiral

Associate Professor  
Mechanical Engineering  
University of Turkish Aeronautical Association

### CONTACT INFORMATION

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### EDUCATION

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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

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**2016 Apr to now 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

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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  $\beta$ -titanium alloy, *Modelling and Simulation in Materials Science and Engineering* 25, no. 3: 035013, 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* 25, no.3: 035010, 2017. **SCI**

## CONFERENCES

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- **M. Demiral**, A. Roy, V.V. Silberschmidt, Effects of strain gradients on texture evolution in nano-indentation experiments: A numerical Study, *3<sup>rd</sup> 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, *4<sup>th</sup> 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, *21<sup>th</sup> 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, *10<sup>th</sup> 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, *8<sup>th</sup> 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, *2<sup>nd</sup> International Conference on Material Modelling (2<sup>nd</sup> 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, *21<sup>th</sup> 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, *13<sup>th</sup> 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, *4<sup>th</sup> 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, *20<sup>th</sup> International Workshop on Computational Mechanics of Materials (IWCMM20)*, Loughborough, UK, 8-10 September 2010.
- **M. Demiral**, A. Roy, V.V. Silberschmidt, Deformation mechanisms in advanced Ti-based alloy in indentation: Size effects, *9<sup>th</sup> 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 10<sup>th</sup> 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**

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### **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**

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### **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**

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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**

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- Editorial Board - IJEEMS
- Outstanding Reviewer – IOP Smart Materials and Structures, 2016
- Referee for

*Zeitschrift für Angewandte Mathematik und Mechanik*

*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*

*Measurement Science and Technology*

*Scientica Irenica*

*Gazi Ünverstes Fen Bilimleri Dergisi Part C: Tasarım ve Teknoloji*

*Ulusal Savunma Uygulamaları Modelleme ve Simülasyon Konferansı Bildiri Hakemliği*

*TÜBİTAK-TEYDEB Project Referee (2 projects)*