

BIOGRAPHICAL SKETCH

Dr. Domenico Umbrello

45/C, Department of Mechanical, Energy and Management Engineering
University of Calabria, Rende, CS, 87036, Italy

Phone: +39 0984 494820 E-mail: domenico.umbrello@unical.it Fax: +39 0984 494673

EDUCATION

University of Calabria, Rende (CS), Italy	PhD	2005	Mechanical Engineering
Ohio State University, Columbus (OH), US	Vis. Sc.	2003	Mechanical Engineering
University of Calabria, Rende (CS), Italy	MS	2001	Mechanical/Manufacturing Eng.

APPOINTMENTS

January 2005 – present: Assistant Professor
Dep. of Mechanical, Energy and Management Engineering, University of Calabria, Italy

March 2011 – August 2012: Visiting Professor
Institute for Sustainable Manufacturing, University of Kentucky, USA

May 2008 – August 2008: Visiting Professor
Center for Manufacturing, University of Kentucky, USA

RESEARCH FIELDS

- Traditional and advanced machining operations, in particular developing fundamental studies on the variables that can be predicted by using the finite element simulation, such as forces, pressure, heat flux, temperatures, thermal phenomena at the tool – chip interface, tool wear and residual stresses;
- Advanced empirical rheological models for hard materials such as AISI 52100 bearing steel, AISI H13 tool steel, AISI 316L stainless steels, Nickel based alloys (IN718, Waspaloy) and Aerospace Aluminum alloy (AA7075-T651)
- Study of surface integrity (residual stresses, white and dark layers, SPD, DRX and grain refinements) by numerical analysis and experimental tests;
- Influence of innovative cooling techniques (near-to-dry, N₂-Cryogenic, etc.) and their influence manufacturing processes for enhancing the Product Life and Performance
- Sustainable machining processes
- FEM-AI hybrid approaches for residual stresses optimization;
- Innovative metallic engineering materials, in particular modeling the behavior of the metallic foams.

SELECTED FIVE PUBLICATIONS 2010-2014

(from a list of over 150 papers including 75 refereed journal papers)

- [1] G. Rotella, O.W. Dillon Jr., **D. Umbrello**, L. Settineri, I. S. Jawahir (2014), “The Effects of Cooling Conditions on Surface Integrity and Product Performance in Machining of Ti6Al4V Alloy”, *Int. J. Adv. Manuf. Technol.*, Vol. 71/1-4, pp. 47-55.
- [2] P.J. Arrazola, T. Ozel, **D. Umbrello**, M. Davies, I.S. Jawahir (2013), “Recent Advances in Modelling of Metal Machining Processes”, *CIRP Annals – Manuf. Technol.*, Vol. 62/2, pp. 695-718 (*CIRP Keynote paper*).
- [3] **D. Umbrello**, F. Micari, I.S. Jawahir (2012), “The Effects of Cryogenic Cooling on Surface Integrity in Hard Machining: A Comparison with Dry Machining”, *CIRP Annals – Manuf. Technol.*, Vol. 61/1, 2012, pp. 103-106.
- [4] I.S. Jawahir, E. Brinksmeier, R. M’Saoubi, D.K. Aspinwall, J.C. Outeiro, D. Meyer, **D. Umbrello**, A.D. Jayal (2011), “Surface Integrity in Material Removal Processes: Recent Advances”, *CIRP Annals – Manuf. Technol.*, Vol. 60/2, pp. 603-626 (*CIRP Keynote paper*).
- [5] **D. Umbrello**, J.C. Outeiro, R. M’Saoubi, A.D. Jayal, I.S. Jawahir (2010), “A numerical model incorporating the microstructure alteration for predicting residual stresses in hard machining of AISI 52100 steel”, *CIRP Annals - Manufacturing Technology*, Vol. 59/1, 2010, pp. 113-116 (*selected product for VQR 2004-2010*).

TEACHING

- Manufacturing and Materials Technology (*Bachelor’s degree in Mechanical Engineering, 3rd year, 1^o semester, 9 cfu*);
- Manufacturing 2 (*Master’s degree in Mechanical Engineering, 1st year, 1^o semester, 9 cfu*).

SYNERGISTIC ACTIVITIES

Honors and Awards

- **August 2011:** Dr. Umbrello was awarded with the **2011 F.W. Taylor Medal of CIRP**.
- **April 2011:** Dr. Umbrello was awarded with the **2011 ESAFORM Scientific Prize**.
- **September 2007:** Dr. Umbrello was awarded with the **2005 AITEM Outstanding Young Manufacturing Research Award** by Italian Manufacturing Society.
- **May 2011:** Best Conference Paper Award (best Top 10): “Finite Element Modeling of Microstructural Changes in Hard Turning”, S. Caruso, S. Di Renzo, D. Umbrello, A.D. Jayal, O.W. Dillon, I.S. Jawahir, 2011, Proc. of the 13th CIRP International Workshop on Modeling of Machining Operations, 12-13 May 2011, Sintra (Portugal), pp. 960-968.
- **May 2009, August 2007, May 2006, May 2005:** 4 Best Conference Paper Awards: CIRP International Workshop on Modeling of Machining Operations.

Editorships

- **Associate Technical Editor** of Machining and Technology: An International Journal, Taylor and Francis (since July 2012).
- **Associate Editor** of Int. J. of Manufacturing Engineering, Hindawi Pub. Corp. (since Dec. 2012).
- **Guest Editor** of International Journal of Machining and Machinability of Materials (Special Issue Vol.6 N°1-2 – 2009) Inderscience Publications.
- **Member of the Editorial Board** of the
 - Int. J. of Machining and Machinability of Materials, Inderscience Pub. (since May 2008);
 - Int. J. of Manufacturing Engineering, Hindawi Pub. Corp. (since Dec. 2012).
 - American J. of Eng. Science & Technology Research, Academic & Scientific Pub. (since Jan. 2013)
- Invited reviewer of scientific and technical papers for 20 international journals and 20 int. conferences.

Membership

since 2012	CIRP – The International Academy for Production Engineering
since 2003	ESAFORM – European Scientific Association for material FORMing
since 2001	Associazione Italiana Tecnologia Meccanica (AITEM)

Member of International Scientific Committees, Coordinator and chair sessions

- Member of the ESAFORM “Board of Directors” (since 2014)
- Technical Secretary of the 10th CIRP International Workshop on Modeling of Machining Operations, 27 – 28 August 2007, Reggio Calabria (Italy)
- Coordinator of the minisymposium on Machining and Cutting within International ESAFORM Conference, (2010 – Currently).
- Member of the International Scientific Committee CIRP International Workshop on Modeling of Machining Operations (2007-currently)
- Member of the International Scientific Committee CIRP International Conference on Surface Integrity (ICSI), (2011-currently)
- Member of the International Scientific Committee of the First International Conference on Sustainable Manufacturing (SM1), October 17-18, 2007, Montreal, Canada
- Chairman of several technical session in Esaform, CIRP MMO Conferences, etc.

Delivered keynote addresses and invited presentations in several countries.

INTERNATIONAL RESEARCH COLLABORATORS

Professor I. S. Jawahir, University of Kentucky, Lexington, UK, USA.

Professor R. Shivpuri, Ohio State University, Columbus, OH, USA.

Professor P.J. Arrazola, Mondragon University, Mondragon, Spain.

Professor J.C. Outeiro – Arts et Metiers ParisTech, Campus of Cluny, Cluny, France.

Professor T. Matsumura, Tokyo Denki University, Tokyo, Japan

Professor T. Mabrouki, INSA Lyon, Lyon, France.

Dr. R. M'Saoubi, Seco Tools, Fargesta, Sweden.

GRADUATE STUDENTS (Total: 60 MS and 2 PhD Students)

Current Graduate Students: 1 post-doc, 3 MS students, 10 BSc students

Recent PhD Graduates:

- S. Caruso (PhD, 2012)
- S. Rizzuti (PhD, 2009; Co-advised with Prof. L. Filice, Currently *Senior Researcher, SKF, Sweden*)