

# Nikolaos Tapoglou, PhD

Assistant Professor

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Dr Nikolaos Tapoglou is an Assistant Professor in the Department of Industrial Engineering and Management of the International Hellenic University Thessaloniki Greece (IHU). He received his Diploma, and M.Sc. with a specialisation in manufacturing processes and a PhD with a specialisation in gear manufacturing processes from the School of Production Engineering and Management of the Technical University of Crete.

Before joining IHU, he led the Emerging machining technology team in the Advanced Manufacturing Research Centre (AMRC) of The University of Sheffield as a Technical Fellow (2016-2021) Between 2013 and 2016 he worked as a Post-Doctoral Research Fellow at Cranfield University.

His research focuses on gear manufacturing processes, CAD/CAM/CAE systems, additive manufacturing processes, sustainable manufacturing technologies (Cryogenic and MQL machining), emerging machining technologies, Cloud manufacturing, the optimisation of advanced manufacturing processes, manufacturing simulation focusing on in-process characteristics and manufacturing informatics. He has co-authored over 45 journal and conference publications and has worked on more than 40 research projects. He is currently the PI of 1 EU-funded project.

## Experience

**Assistant Professor**, Dep. of Industrial Engineering and Management, International Hellenic University, Thessaloniki, Greece 2021–Present

Research on manufacturing science, emerging machining technologies and cloud manufacturing. Development of research collaborations with academic and industrial partners. Lecturing on engineering and manufacturing science subjects (see [Teaching](#) below). Supervision of students in the context of Diploma and Master thesis (see [Supervision](#) below).

**Technical Fellow**, in Emerging Machining Technologies, Advanced Manufacturing Research Center (AMRC with Boeing), The University of Sheffield, UK. 2019–2021

Research in publicly, industrially and Board funded projects in emerging machining technologies such as cryogenic, ultrasonic and hybrid machining. Leading the work in the machining of Ceramic Matrix Composites. Responsible for the technical leadership of projects (see [Projects](#) below). Coordinating the collaboration with research institutions. Line management of a team of 6 research engineers. Coaching of junior engineers. Supervision of students in the context of PhD thesis (see [Supervision](#) below).

**Technical Lead**, in Emerging Machining Technologies, Advanced Manufacturing Research Center (AMRC with Boeing), The University of Sheffield, UK. 2016–2019

Research in publicly, industrially and Board funded projects in emerging machining technologies such as cryogenic, ultrasonic and hybrid machining (see [Projects](#) below). Coordinating the collaboration with research institutions. Line management of a team of 3 research engineers. Coaching of junior engineers.

**Research Fellow**, Through-Life Data Analysis and Visualisation, School of Aerospace, Transport and Manufacturing, Cranfield University, UK. 2015–2016

Project manager and workpackage leader on EU and Industrially funded projects “LegInt” – Advancing Legacy Machine Tools into the Digital Manufacturing Century with University of Patras (Greece) and Formtec GmbH (Germany) and “Mind Palace” – Visualization and Data Analytics for Through-life Engineering with Rolls-Royce.

**Research Fellow**, Implementation of Sustainable Manufacturing, School of Aerospace, Transport and Manufacturing, Cranfield University, UK. 2013–2015

Project manager and work package leader the FP7 EU project CAPP-4-SMEs “Collaborative and Adaptive Process Planning for Sustainable Manufacturing Environments” with KTH University (Stockholm, Sweden, lead), Coventry University (UK), University of Patras (Greece), and 7 industry partners (£5M)

**Research Associate and Teaching Assistant**, Dep. Production Engineering and Management, Technical University of Crete, Greece. 2009–2012

Research on publicly funded projects. Managing daily operation of the Micromachining and Manufacturing Modeling laboratory, Lecturing on engineering and manufacturing science subjects.

## Education

- Doctor of philosophy (Ph.D.),** Dep. of Production Engineering and Management, Technical University of Crete, Greece 2012  
Subject of the dissertation: Gear hobbing simulation and investigation of the technological parameters involved
- Master of Science (M.Sc.),** Dep. of Production Engineering and Management, Technical University of Crete, Greece 2008  
Subject of the dissertation: CAD-based simulation of Face Milling
- Diploma in Engineering (Dipl. Eng),** Dep. of Production Engineering and Management, Technical University of Crete, Greece 2006  
General curriculum in mechanical engineering. 5-year curriculum with an integrated master. Subject of the dissertation: Design and execution of machining processes, in three-axis milling machines, using Pro/Engineer

## Projects

- SCORE Sustainable manufacturing of aerospace commodities** 2023–2026  
Project funded by: Eurostars, European Partnership on Innovative SMEs, Role: Primary Investigator
- IHYM Interrupted Hybrid Manufacturing** 2018–2019  
Project funded by: Innovate UK, Role: Technical Fellow
- "LegInt" – Advancing Legacy Machine Tools into the Digital Manufacturing Century** 2016  
Project funded by: CPSE Labs EU program, Role: Main researcher and Project manager
- "Mind Palace" – Visualization and Data Analytics for Through-life Engineering** 2015–2016  
Project funded by: Rolls Royce through the EPSRC Centre for through life engineering services, Role: Main researcher and Project manager
- CAPP-4-SMEs** Collaborative and Adaptive Process Planning for Sustainable Manufacturing Environments 2013–2015  
Project funded by: European Commission H2020 programme, Role: Main Researcher, Project manager
- Optimization of technological parameters during the manufacturing of gears with gear hobbing** 2010–2012  
Project funded by: European Union (European Social Fund – ESF) and Greek national funds, Role: Main researcher and Project manager

Participation in a further 30 research projects in a variety of roles (8 as PI and Co-I role).

## Teaching

- Visiting professor,** Aristotle University of Thessaloniki (Autonomous teaching) 2024–Present  
*Course:* Machine Elements II
- Assistant Professor,** International Hellenic University (Autonomous teaching) 2021–Present  
*M.Sc. Course:* Reverse Engineering (1 Semester)  
*M.Sc. Course:* Applied Manufacturing systems  
*M.Sc. Course:* 3D scanning and 3D printing (1 Semester)  
*Course:* Technical Drawing  
*Course:* Hydraulic and Pneumatic systems  
*Course:* CAD, CAM, CAE  
*Course:* Health and Safety

## Supervision

### Active students

*Doctorate researchers (PhD):* 1

*MSc Students (MSc):* 3

*Undergraduate thesis:* 10

### Completed students

*Engineering Doctorate researchers (EngD):* 3

*PhD viva examiner:* 2

*MSc by Research Students (MRes):* 3

*MSc Students (MSc):* 5

*Undergraduate thesis:* 10/30

## Languages

Mother tongue **Greek**  
Other languages<sup>1</sup>

**English**  
**Italian**

Understanding		Speaking				Writing	
		Listening	Reading	Interaction	Production		
C2	Fluent	C2	Fluent	C2	Fluent	C2	Fluent
B2	Independent	B2	Independent	B2	Independent	B2	Independent

## Publications

### Books and edited proceedings

- [1] **Tapoglou, N.**, (Eds.), (2023). Emerging Micro Manufacturing Technologies and Applications, Micromachines, MDPI, ISBN: 978-3-0365-8213-9
- [2] Roy, R., Tomiyama, T., Tiwari, A., Tracht, K., Shehab, E., Mehnen, J., Erkoyuncu, J. A., **Tapoglou, N.**, (Eds.), (2017). Proceedings of the 5th International Conference in Through-life Engineering Services Cranfield University, 1st and 2nd November 2016, CIRP Procedia vol. 59, Elsevier, ISBN: 978-1-5108-3732-4
- [3] Roy, R., Tiwari, A., Tracht, K., Shehab, E., Mehnen, J., Erkoyuncu, J. A., **Tapoglou, N.**, Tomiyama, T. (Eds.), (2015). Proceedings of the 4th International Conference on Through-life Engineering Services, CIRP Procedia vol. 38, Elsevier, ISBN: 978-1-5108-1522-3

### Journal Articles

- [4] Efstathiou, C., Tsormpatzoglou, I., **Tapoglou, N.**, (2023). Parametric Modeling of Curvic Couplings and Analysis of the Effect of Coupling Geometry on Contact Stresses in High-Speed Rotation Applications, *Machines*, 11 (8), doi: [10.3390/machines11080822](https://doi.org/10.3390/machines11080822), (IF:2.600)
- [5] Proud, L., **Tapoglou N.**, Wika, K. K., Taylor, C. M., Slatter, T., (2023). Role of CO2 cooling strategies in managing tool wear during the shoulder milling of grade 2 commercially pure titanium, *Wear*, p. 204798, doi: <https://doi.org/10.1016/j.wear.2023.204798>, (IF:4.695)
- [6] Tzotzis, A., Tsagaris, A., **Tapoglou, N.**, Kyratsis, P., (2023). High-precision CAD-based simulation for turning considering tool microgeometry, *International Journal of Mechatronics and Manufacturing Systems*, 16 (1), pp. 83–95, doi: [10.1504/IJMMS.2023.132023](https://doi.org/10.1504/IJMMS.2023.132023), (IF:1.000)
- [7] Efstathiou, C., **Tapoglou, N.**, (2022). Simulation of spiral bevel gear manufacturing by face hobbing and prediction of the cutting forces using a novel CAD-based model, *The International Journal of Advanced Manufacturing Technology*, 122, pp. 3789–3813, doi: [10.1007/s00170-022-10065-x](https://doi.org/10.1007/s00170-022-10065-x), (IF:3.471)
- [8] Proud, L., **Tapoglou, N.**, Slatter, T., (2022). A Review of CO2 Coolants for Sustainable Machining, *Metals*, 12 (2), doi: [10.3390/met12020283](https://doi.org/10.3390/met12020283), (IF:2.351)
- [9] **Tapoglou, N.**, Clulow, J., Patterson, A., Curtis, D., (2022). Characterisation of mechanical properties of 15-5PH stainless steel manufactured through direct energy deposition, *CIRP Journal of Manufacturing Science and Technology*, 38, pp. 172–185, doi: <https://doi.org/10.1016/j.cirpj.2022.04.004>, (IF:3.602)
- [10] **Tapoglou, N.**, Clulow, J., Curtis, D., (2022). Increased shielding of a Direct Energy Deposition process to enable Deposition of reactive materials; an investigation into Deposition of 15-5 PH Stainless Steel, Inconel 718 and Ti-6Al-4V, *CIRP Journal of Manufacturing Science and Technology*, 36, pp. 227–235, doi: <https://doi.org/10.1016/j.cirpj.2020.11.013>, (IF:3.602)
- [11] Tzotzis, A., **Tapoglou, N.**, Verma, R. K., Kyratsis, P., (2022). 3D-FEM Approach of AISI-52100 Hard Turning: Modelling of Cutting Forces and Cutting Condition Optimization, *Machines*, 10 (2), doi: [10.3390/machines10020074](https://doi.org/10.3390/machines10020074), (IF:2.428)
- [12] Childerhouse, T., Hernández-Nava, E., **Tapoglou, N.**, M'Saoubi, R., Franca, L., Leahy, W., Jackson, M., (2021). The influence of finish machining depth and hot isostatic pressing on defect distribution and fatigue behaviour of selective electron beam melted Ti-6Al-4V, *International Journal of Fatigue*, 147, p. 106169, doi: <https://doi.org/10.1016/j.ijfatigue.2021.106169>, (IF:5.186)
- [13] Efstathiou, C., **Tapoglou, N.**, (2021). A novel CAD-based simulation model for manufacturing of spiral bevel gears by face milling, *CIRP Journal of Manufacturing Science and Technology*, 33, pp. 277–292, doi: <https://doi.org/10.1016/j.cirpj.2021.04.004>, (IF:3.602)
- [14] Kyratsis, P., Tzotzis, A., Markopoulos, A., **Tapoglou, N.**, (2021). CAD-Based 3D-FE Modelling of AISI-D3 Turning with Ceramic Tooling, *Machines*, 9 (1), doi: [10.3390/machines9010004](https://doi.org/10.3390/machines9010004), (IF:2.428)

- [15] **Tapoglou, N.**, (2021). Development of Cutting Force Model and Process Maps for Power Skiving Using CAD-Based Modelling, *Machines*, 9 (5), doi: [10.3390/machines9050095](https://doi.org/10.3390/machines9050095), (IF:2.428)
- [16] **Tapoglou, N.**, Clulow, J., (2021). Investigation of hybrid manufacturing of stainless steel 316L components using direct energy deposition, *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 235 (10), pp. 1633–1643, doi: [10.1177/0954405420949360](https://doi.org/10.1177/0954405420949360), (IF:2.610)
- [17] Mourtzis, D., Vlachou, E., Milas, N., **Tapoglou, N.**, Mehnen, J., (2019). A cloud-based, knowledge-enriched framework for increasing machining efficiency based on machine tool monitoring, *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 233 (1), pp. 278–292, doi: [10.1177/0954405417716727](https://doi.org/10.1177/0954405417716727), (IF:2.610)
- [18] **Tapoglou, N.**, (2019). Calculation of non-deformed chip and gear geometry in power skiving using a CAD-based simulation, *The International Journal of Advanced Manufacturing Technology*, 100 (5-8), pp. 1779–1785, doi: [10.1007/s00170-018-2790-3](https://doi.org/10.1007/s00170-018-2790-3), (IF:3.226)
- [19] **Tapoglou, N.**, Mehnen, J., Vlachou, A., Doukas, M., Milas, N., Mourtzis, D., (2015). Cloud-Based Platform for Optimal Machining Parameter Selection Based on Function Blocks and Real-Time Monitoring, *Journal of Manufacturing Science and Engineering*, 137 (4), doi: [10.1115/1.4029806](https://doi.org/10.1115/1.4029806), (IF:3.033)
- [20] **Tapoglou, N.**, Mammias, A., Antoniadis, A., (2013). Influence of machining data on developed cutting forces in gear hobbing, *International Journal of Machining and Machinability of Materials*, 14 (1), p. 66, doi: [10.1504/IJMMM.2013.055121](https://doi.org/10.1504/IJMMM.2013.055121), (SJR:0.467)
- [21] **Tapoglou, N.**, Antoniadis, A., (2012). 3-Dimensional kinematics simulation of face milling, *Measurement*, 45 (6), pp. 1396–1405, doi: <https://doi.org/10.1016/j.measurement.2012.03.026>, (IF:3.927)
- [22] **Tapoglou, N.**, Aristomenis, A., (2012). CAD-Based Calculation of Cutting Force Components in Gear Hobbing, *Journal of Manufacturing Science and Engineering*, 134 (3), doi: [10.1115/1.4006553](https://doi.org/10.1115/1.4006553), (IF:3.033)
- [23] Kyratsis, P., **Tapoglou, N.**, Bilalis, N., Antoniadis, A., (2011). Thrust force prediction of twist drill tools using a 3D CAD system application programming interface, *International Journal of Machining and Machinability of Materials*, 10 (1/2), p. 18, doi: [10.1504/IJMMM.2011.040852](https://doi.org/10.1504/IJMMM.2011.040852), (SJR:0.467)

## Book Chapters

- [24] **Tapoglou, N.**, Efstathiou, C., Tzotzis, A., Kyratsis, P., (2023). Study of the Topography of Face Milled Surfaces Using CAD-Based Simulation, *Computational Design and Digital Manufacturing*, pp. 159–166, Springer Nature Singapore, doi: [10.1007/978-3-031-21167-6\\_8](https://doi.org/10.1007/978-3-031-21167-6_8)
- [25] **Tapoglou, N.**, Tzotzis, A., Kyratsis, P., Efstathiou, C., (2023). Evaluation of Gear Flanks Using Gear Topography Data, *Computer-Aided Design: Advances in Research and Applications*, pp. 161–166, Nova Science Publishers, doi: [10.52305/IMIY7382](https://doi.org/10.52305/IMIY7382)
- [26] **Tapoglou, N.**, Kyratsis, P., (2022). Investigation of Gear Profile Deviations in Gear Planning Process Through CAD-Based Simulation, *Recent Advances in Manufacturing Modelling and Optimization*, pp. 89–94, Springer Nature Singapore, doi: [10.1007/978-981-16-9952-8\\_9](https://doi.org/10.1007/978-981-16-9952-8_9)
- [27] **Tapoglou, N.**, Mehnen, J., Butans, J., (2021). Energy Efficient Machining Through Evolutionary Real-Time Optimization of Cutting Conditions on CNC-Milling Controllers, *Experiments and Simulations in Advanced Manufacturing*, pp. 1–18, Springer International Publishing, doi: [10.1007/978-3-030-69472-2\\_1](https://doi.org/10.1007/978-3-030-69472-2_1)
- [28] Mehnen, J., He, H., Tedeschi, S., **Tapoglou, N.**, (2017). Practical Security Aspects of the Internet of Things, *Cybersecurity for Industry 4.0: Analysis for Design and Manufacturing*, pp. 225–242, Springer International Publishing, doi: [10.1007/978-3-319-50660-9\\_9](https://doi.org/10.1007/978-3-319-50660-9_9)

## Conference Proceedings

- [29] **Tapoglou, N.**, (2021). Investigation of Gear Surface Topography and Deviations in Gear Power Skiving Through Advanced CAD Modeling Based Simulation, *American Gear Manufacturer's Association Fall Technical Meeting*, AGMA,
- [30] **Tapoglou, N.**, Taylor, C., Makris, C., (2021). Milling of aerospace alloys using supercritical CO<sub>2</sub> assisted machining, 9th CIRP Conference on High Performance Cutting, *Procedia CIRP*, vol. 101, pp. 370–373, doi: <https://doi.org/10.1016/j.procir.2020.06.008>
- [31] Childerhouse, T., Hernandez-Nava, E., M'Saoubi, R., **Tapoglou, N.**, Jackson, M., (2020). Surface and sub-surface integrity of Ti-6Al-4V components produced by selective electron beam melting with post-build

finish machining, 5th CIRP Conference on Surface Integrity (CSI 2020), *Procedia CIRP*, vol. 87, pp. 309–314, , doi: <https://doi.org/10.1016/j.procir.2020.02.018>

- [32] **Tapoglou, N.**, Makris, C., (2020). CO<sub>2</sub>-assisted machining of biocompatible polymer materials, 30th International Conference on Flexible Automation and Intelligent Manufacturing (FAIM2021), *Procedia Manufacturing*, vol. 51, pp. 801–805, , doi: <https://doi.org/10.1016/j.promfg.2020.10.112>
- [33] **Tapoglou, N.**, Taylor, C., (2019). Ultrasonic Vibration Assisted Milling of Aerospace Materials, ASME International Mechanical Engineering Congress and Exposition IMECHE2019, ,, , doi: [10.1115/IMECE2019-11780](https://doi.org/10.1115/IMECE2019-11780)
- [34] Busachi, A., Erkoyuncu, J., Colegrove, P., Drake, R., Watts, C., Martina, F., **Tapoglou, N.**, Lockett, H., (2018). A System Approach for Modelling Additive Manufacturing in Defence Acquisition Programs, 11th CIRP Conference on Intelligent Computation in Manufacturing Engineering, 19-21 July 2017, Gulf of Naples, Italy, *Procedia CIRP*, vol. 67, pp. 209–214, , doi: <https://doi.org/10.1016/j.procir.2017.12.201>
- [35] **Tapoglou, N.**, Lopez, M. I. A., Cook, I., Taylor, C. M., (2017). Investigation of the Influence of CO<sub>2</sub> Cryogenic Coolant Application on Tool Wear, Manufacturing Systems 4.0 – Proceedings of the 50th CIRP Conference on Manufacturing Systems, *Procedia CIRP*, vol. 63, pp. 745–749, , doi: <https://doi.org/10.1016/j.procir.2017.03.351>
- [36] Tedeschi, S., Mehnen, J., **Tapoglou, N.**, Roy, R., (2017). Secure IoT Devices for the Maintenance of Machine Tools, Proceedings of the 5th International Conference in Through-life Engineering Services Cranfield University, 1st and 2nd November 2016, *Procedia CIRP*, vol. 59, pp. 150–155, , doi: <https://doi.org/10.1016/j.procir.2016.10.002>
- [37] **Tapoglou, N.**, Mehnen, J., (2016). Cloud-based Job Dispatching Using Multi-criteria Decision Making, Research and Innovation in Manufacturing: Key Enabling Technologies for the Factories of the Future - Proceedings of the 48th CIRP Conference on Manufacturing Systems, *Procedia CIRP*, vol. 41, pp. 661–666, , doi: <https://doi.org/10.1016/j.procir.2015.12.081>
- [38] **Tapoglou, N.**, Mehnen, J., Butans, J., Morar, N. I., (2016). Online on-board Optimization of Cutting Parameter for Energy Efficient CNC Milling, 13th Global Conference on Sustainable Manufacturing – Decoupling Growth from Resource Use, *Procedia CIRP*, vol. 40, pp. 384–389, , doi: <https://doi.org/10.1016/j.procir.2016.01.072>
- [39] **Tapoglou, N.**, Mehnen, J., (2015). A Framework for Cloud Manufacturing Enabled Optimisation for Machining, APMS 2015 International conference Advances in production management systems, , pp. 363–370, Springer International Publishing, ISBN: 978-3-319-22759-7
- [40] Tedeschi, S., Mehnen, J., **Tapoglou, N.**, Rajkumar, R., (2015). Security Aspects in Cloud Based Condition Monitoring of Machine Tools, Proceedings of the 4th International Conference on Through-life Engineering Services, *Procedia CIRP*, vol. 38, pp. 47–52, , doi: <https://doi.org/10.1016/j.procir.2015.07.046>
- [41] **Tapoglou, N.**, Mehnen, J., Doukas, M., Mourtzis, D., (2014). Optimal Machining Parameter Selection Based on Real-Time Machine Monitoring Using IEC 61499 Function Blocks for Use in a Cloud Manufacturing Environment: A Case Study for Face Milling, V001T04A015, ,vol. ASME 2014 International Manufacturing Science and Engineering Conference collocated with the JSME 2014 International Conference on Materials and Processing and the 42nd North American Manufacturing Research Conference, , doi: [10.1115/MSEC2014-4022](https://doi.org/10.1115/MSEC2014-4022)
- [42] **Tapoglou, N.**, Antoniadis, A., (2011). Hob3D A novel gear hobbing simulation software, 2011 International Conference of Mechanical Engineering ICME 2011, ,, ISBN: 978-988-18210-6-5
- [43] **Tapoglou, N.**, Antoniadis, A., (2010). CAD-Based calculation of cutting force components in gear hobbing, Design, Technology and Management in Manufacturing D.T.M.M.-2010, , pp. 21–30,
- [44] **Tapoglou, N.**, Belis, T., Vakondios, D., Antoniadis, A., (2010). CAD-based simulation of gear hobbing, 31st International Symposium on Mechanics of Materials, ,, ISBN: 978-3-939195-18-4
- [45] **Tapoglou, N.**, Antoniadis, A., (2009). Influence of Cutting Conditions on Surface Quality in Face Milling, International Conference on Manufacturing Systems ICMS 2009, ,,
- [46] **Tapoglou, N.**, Maravelakis, M., Antoniadis, A., (2009). 3D Simulation of Face Milling, International Conference on Mechanical and Industrial Engineering ICMIE 2009, ,,

## Conference Presentations

- [47] **Tapoglou, N.**, Clulow, J., (2020). Interrupted Hybrid Additive and Subtractive Manufacturing of Parts for the Aerospace and the Oil and Gas Industries, ASTM International Conference on Additive Manufacturing ASTM ICAM 2021
- [48] **Tapoglou, N.**, Clulow, J., (2019). Interrupted Hybrid Additive and Subtractive Manufacturing of Parts for the Aerospace and the Oil and Gas Industries, ASME 2019 International Mechanical Engineering Congress and Exposition, November 11–14, 2019, Salt Lake City, Utah, USA
- [49] **Tapoglou, N.**, Efstathiou, C., (2019). Simulation of manufacturing gears through power skiving using a CAD based approach, ASME 2019 International Mechanical Engineering Congress and Exposition, November 11–14, 2019, Salt Lake City, Utah, USA