

Special Issue of [Applied Ontology](#) on:
Formal ontologies in manufacturing

Guest Editors

Bob Young, Wolfson School of Mechanical, Electrical and Manufacturing Engineering,
Loughborough University, UK
R.I.Young@lboro.ac.uk

Emilio M. Sanfilippo, Laboratory of Digital Sciences (LS2N), French National Centre for
Scientific Research (CNRS)
Emilio.Sanfilippo@ls2n.fr

Yoshinobu Kitamura, College of Information Science and Engineering, Ritsumeikan University,
Japan
y-kita@fc.ritsumei.ac.jp

Manufacturing's ever present drive to be "better, faster and cheaper" is recognising the potential value to be achieved through the better sharing of cross-disciplinary information and the effective exploitation of new advances based on Artificial Intelligence techniques. The ideas, methods and technologies at the grounds of Industrie 4.0, Smart Manufacture and the Internet of Things are revolutionising the manner in which goods are produced, and data are collected, organised, analysed and integrated. For manufacturing drivers to achieve real value they require the underlying technological support; the resolution of a range of ontological issues are critical to manufacturing success.

The purpose of this special issue is to provide a contribution to the application of ontology in manufacturing. The papers accepted for publication will show a trade-off between conceptual analysis, formal representation and application potential to the manufacturing domain. According to the overall philosophy of Applied Ontology, authors will need to explicitly introduce and motivate their modelling choices, present a formal treatment of the knowledge at stake (in the formal language they prefer), and address how the presented work can be used in manufacturing scenarios.

List of potential topics (the list is not exhaustive):

- Ontology-based representation of processes, including production processes exploiting emergent technologies like additive and hybrid manufacturing, but also machining processes, logistic processes, among others;
- Integration of ontologies and ontology-based technologies with manufacturing information systems to manage, monitor, optimise or simulate processes;
- Ontology-based representation of manufacturing resources, including agent-based resources and robots;

- Ontology-based representation of manufacturing services, e.g., cloud-based services;
- Ontologies addressing context-driven data management and knowledge representation;
- Ontology-based representation of manufacturing systems as socio-technical systems;
- Ontology-based representation of cyber-physical systems;
- Formal representation of assembly relations based on mereo-topological theories extended with domain knowledge to capture engineering relevant constraints;
- Core ontologies for manufacturing based on foundational ontologies;
- Ontology-based patterns for the representation of manufacturing knowledge;
- Open challenges about the ontological representation of manufacturing knowledge.

Publication schedule:

- Notification of intent to submit: 31 January 2018 (email to Emilio Sanfilippo **and** Yoshinobu Kitamura);
- Full paper due for review: 1 May 2018;
- Notification of review decision: 30 June 2018;
- Revised manuscript submission: 15 September 2018;
- Final decision: 15 October 2018
- Expected date of publication: November/December 2018

Papers are to be submitted **non-anonymously** following the guidelines at:

<https://www.iospress.nl/journal/applied-ontology/>

Please specify in an attached cover letter that the paper is submitted to the Special Issue: **Formal ontologies in manufacturing.**

Why Applied Ontology

Applied Ontology (AO) is the flagship journal of the International Association for Ontology and its Application (IAOA). Differently from other journals, AO promotes scientific articles that promote the development of ontologies based on principled and robust modelling choices. In line with the spirit of AO, with this special issue, we aim at dealing with the modelling challenges of manufacturing by profiting of the theoretical, formal and interdisciplinary techniques of Ontology Engineering.

Guest Editors

Bob Young is Visiting Professor of Manufacturing Informatics in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering at Loughborough University in the UK. He has some 40 years experience in new product development and manufacturing engineering, working both in UK industry and in academia. Prof Young's research has been funded directly by industry, by UK funding agencies and by the EU. As well as support for industry, his work has led to around 200 research publications and some 20 PhD completions. His research is focused on exploiting advanced Information and Communications Technologies to aid multi-disciplinary teams of engineers in their decision-making through the provision of timely, high quality information and knowledge. To that end his research in recent years has been heavily focused towards the development and use of formal ontologies as a basis for effective knowledge sharing and interoperability in manufacturing.

Yoshinobu Kitamura is a professor at the College of Information Science and Engineering, Ritsumeikan University, Japan. He has been active in the ontology-based engineering knowledge research field since 1995, developing a strongly interdisciplinary approach that combines together Ontological Engineering and Engineering Design, on the basis of collaborative research with industry. He has published around 80 research publications in international journals and conferences both in the Ontological Engineering field such as AO and FOIS and in the Engineering Design field such as JED, ICED and ASME/IDETC.

Emilio M. Sanfilippo is post-doc researcher at the Laboratory of Digital Sciences (LS2N) at CNRS (France). His research focuses on Ontology Engineering to support product lifecycle information modeling with a specific target on design and manufacturing. He is part of the Technical Oversight Board of the Industry Ontology Foundry (IOF), an initiative led by the U.S. NIST to promote the development and application of well-founded ontologies in industry. In September 2017, he co-chaired the 8th International Workshop on Formal Ontologies meet Industry (FOMI).