

Personal information



Lunetto Vincenzo

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📅 Date of birth 25/07/1993 | 🇮🇹 Nationality Italian

TITLE OF QUALIFICATION
AWARDED

MSc in Mechanical Engineering

LIST OF PUBLICATIONS

A Survey on Energy Efficiency in Metal Wire Deposition Processes. Catalano, Angioletta R.; Lunetto, Vincenzo; Priarone, Paolo C.; Settineri, Luca. Submitted. 6th International Conference on Sustainable Design and Manufacturing (KES-SDM-19), Budapest (Hungary), July 4-5, 2019.

Laser powder bed fusion (L-PBF) additive manufacturing: On the correlation between design choices and process sustainability. Priarone, Paolo C.; Lunetto, Vincenzo; Atzeni, Eleonora; Salmi, Alessandro. *Procedia CIRP* 78(2018), pp. 85-90. 6th CIRP Global Web Conference "Envisaging the future manufacturing, design, technologies and systems in innovation era", Shantou (China), October 23-25, 2018.

Comments About the Human Health Risks Related to Additive Manufacturing. Lunetto, Vincenzo; Catalano, Angioletta R.; Priarone, Paolo C.; Settineri, Luca. 130(2019), pp. 95-104. 5th International Conference on Sustainable Design and Manufacturing (KES-SDM-18), Gold Coast (Australia), June 24-26, 2018.

The Role of re-design for Additive Manufacturing on the Process Environmental Performance. Priarone, Paolo C.; Ingarao, Giuseppe; Lunetto, Vincenzo; Di Lorenzo, Rosa; Settineri, Luca. *PROCEDIA CIRP* 69(2018), pp. 124-129. 25th CIRP Life Cycle Engineering (LCE) Conference, Copenhagen (Denmark), 30 April – 2 May, 2018.

Post-processing di materie plastiche e tecnologie di giunzione. (Post-processing of polymers and joining technologies). Lunetto, V.; Priarone, P. C. Chapter book, *I Scuola AIM Vol.5*, pp. 345-358, 2018.

EDUCATION AND TRAINING

11/2017–In progress

PhD in Management, Production and Design

Thesis title: "Advances in economic, environmental and social sustainability of additive manufacturing through the product life cycle"

"PhD topic: The awareness concerning the impact of industrial activities and the growing regulatory pressure on environmental sustainability have led the manufacturing sector to seek for solutions to reduce resource consumption and GHG emissions, for instance by increasing the energy efficiency of production systems and by recycling materials. However, environmental sustainability is only one of the three pillars of sustainable development, which must also include economic sustainability and social sustainability. These issues represent a rapidly expanding branch of industrial and academic research. The literature highlights how different levels of analysis (from the single production process to the entire industrial supply chain) are necessary. Additive Manufacturing (AM), due to its intrinsic process peculiarities, including the flexible realization of (almost) any kind of complex shape, has a great potential for improving the material use efficiency. The objectives of the PhD

research activities can be resumed as it follows:

- (1) To identify and tune up procedures and big data-based acquisition tools for the in-line process monitoring, while accounting for the peculiar resource flows;
- (2) To further develop the whole life cycle assessment by empirically and/or analytically modelling the different contributions to the energy/resource requirements and to the environmental GHG impact of additive manufacturing. Moreover, the total industrial supply chain under the circular economy point of view is wanted to be studied;
- (3) To finally clarify the lack of clarity on the Specific Energy Consumption (SEC) for the AM processes. There is actually a lack of knowledge of how it changes with the process parameters for a precise AM technology and quite often a large range of variation is proposed in literature. The attention to this subject is particularly important for AM processes because the SEC factor to produce plastic and metal parts is usually much higher than that of more traditional manufacturing routes, such as machining or injection molding;
- (4) To propose a multiobjective decision support tool (costs, energy and GHG savings) for identifying the most sustainable approach while varying its main factors of influence (such as the batch size, the type and amount of involved materials, the geometrical product specifications and so forth);
- (5) To evaluate the hazardous related to AM processes such as powder handling and emission of decomposed carcinogenic plastic components;
- (6) To transfer the acquired knowledge into the being created Sustainable Manufacturing Lab of the Department of Management and Production Engineering of Politecnico di Torino as initial step and more in general in the industrial context in the future."

Politecnico di Torino, Torino (Italy)

2017-In progress **Assistant professor for the course Manufacturing processes and technologies**
Politecnico di Torino, Torino (Italy)

2017-2018 **Assistant professor for the course Manufacturing Technology**
Free University of Bozen-Bolzano, Bolzano (Italy)

09/2015-25/10/2017 **MSc in Mechanical Engineering**
Thesis title: "Sustainability assessment of additive manufacturing processes"

"Abstract: Additive Manufacturing techniques are spreading on the manufacturing panorama. It is worth the application of the sustainable manufacturing principles. The three aspects of sustainability, namely environmental, economic and social sustainability are critically analyzed. Evaluations are reported on body weight, cancer, cardiovascular, dermal, endocrine, gastrointestinal, hematological, hepatic, musculoskeletal, neurological, ocular, rheumatologic, renal, reproductive, respiratory effects for Cobalt, Chrome, Nickel, Titanium and for different exposure paths (inhalation, oral, dermal). Methods for evaluation of inventory's dissimilar pollution loads have been proposed. Considerations on the workplace maintenance techniques (according to ASTM, NFPA and OSHA) are evaluated. The evolution of the main economic, energetic and CO₂ emissions models is evaluated. The functional redesign via topology optimization (NX, ANSYS) is accounted for an aeronautical component. The elaborated models have been applied to selected case study before and after the redesign phase. The production of the new components was carried on via SLM."

Final mark: 110/110 cum Laude

Politecnico di Torino, Torino (Italy)

09/09/2017 **IELTS (Academic) with overall mark 6**

03/03/2017–28/07/2017 **International program E+/EU PROGRAMME COUNTRIES 2016/2017**
Thesis abroad with title "Sustainability assessment of additive manufacturing processes" (30 CFU)
Norges Teknisk-Naturvitenskapelige Universitet (NTNU), Trondheim (Norway)

08/2016–12/2016 **Scholarship for carrying out research activities on the topic "Analysis of production technologies for the thermal insulation of automotive engine components"**

"Abstract of the final report: Between the hot parts of the automotive components and the outside environment, the thermal gradient is very high. This can cause large losses of heat and therefore waste of energy that could be used inside the engine to increase its performance. To create a suitable insulating layer that would guarantee the desired performance, research has been carried out on the already established techniques and on processes that are still at an experimental level."

Politecnico di Torino, Torino (Italy)

14/12/2016 **GRE® General Test**

27/07/2015–28/08/2015 **Intermediate english course level**

The Language House, Liverpool (United Kingdom)

11/2012–07/2015 **Bachelor in Mechanical Engineering**

Thesis title: "State of art of hybrid joints in metallic material and composites"

"Abstract: The increasingly stringent constraints in the automotive and aerospace sectors are shifting the attention to the choice of lighter, but at the same time more performance materials. To this regard, the choice of hybrid structures between composite materials and light metals seems to be the right direction to follow. Because of the different mechanical and thermal properties between these two different families of materials, their junction processes are particularly critical. An evaluation of the criticalities in innovative welding processes such as Ultrasonic Welding and Laser Welding is presented in the Thesis. Special attention is reported to the welding techniques resulting from the Friction Stir Welding process."

Final mark: 110/110 cum Laude

Università degli Studi di Palermo - Scuola Politecnica, Palermo (Italy)

07/2014 **Intermediate english course level**

The New School of English, Cambridge (United Kingdom)

PERSONAL SKILLS

09/2015–03/2016 **Part-time collaboration**

Participation in a study group for the preparation of didactic material for the courses (i) Manufacturing processes and technologies and (ii) Productive systems analysis and management

Politecnico di Torino, Torino (Italy)

08/2014 **Work experience as a waiter, London (United Kindom)**

Communication skills Good communication skills acquired through volunteer activities in oratory

Organizational and management skills Good organizational skills gained in university group projects. Example of projects carried out:

- Project of an industrial food freezing systems - Thermal flow study (steady state and transient condition on MATLAB)
- Design of pendular reducer with parallel axes with two speed jumps

- Injection molding on a car fender on VISIflow
- Static and dynamic analysis of a rubber antishock support on Ansys
- Dynamic behavior of an automobile suspension on MATLAB
- Flexural Dynamic Behavior of a cantilever beam equipped with a dynamic damper: FE analysis and experimental validation Identification of vibrating structures, effects of dynamic dampers on MATLAB
- Study of the dynamic behaviour of the support structure of an instrument, mounted on a satellite on MATLAB
- Rotordynamic analysis of a turbine shaft on MATLAB

Professional skills Capable to use professional softwares such as: MATLAB, Ansys, SolidWorks, Inventor, Siemens NX, VISIflow, Minitab

Torino, 13 May 2019

Vincenzo Lunetto