

Editorial

Special Issue of the Manufacturing Engineering Society 2020 (SIMES-2020)

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Abstract: The Special Issue of the Manufacturing Engineering Society 2020 (SIMES-2020) has been launched as a joint issue of the journals “Materials” and “Applied Sciences”. The 14 contributions published in this Special Issue of Applied Sciences present cutting-edge advances in the field of Manufacturing Engineering focusing on advances and innovations in manufacturing processes; additive manufacturing and 3D printing; manufacturing of new materials; Product Lifecycle Management (PLM) technologies; robotics, mechatronics and manufacturing automation; Industry 4.0; design, modeling and simulation in manufacturing engineering; manufacturing engineering and society; and production planning. Among them, the topic “Manufacturing engineering and society” collected the highest number of contributions (representing 22%), followed by the topics “Product Lifecycle Management (PLM) technologies”, “Industry 4.0”, and “Design, modeling and simulation in manufacturing engineering” (each at 14%). The rest of the topics represent the remaining 35% of the contributions.

Keywords: manufacturing engineering; product lifecycle management; machining; metal forming; additive manufacturing; Industry 4.0; robotics; design; modeling; society



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After the complete success of the first [1] and second editions [2,3] of the Special Issues of the Manufacturing Engineering Society (SIMES), with 48 and 39 (29 in Materials and 10 in Applied Sciences) contributions, respectively, on emerging methods and technologies, the Special Issue of the Manufacturing Engineering Society 2020 (SIMES-2020) [4] was launched, again, as a joint issue of the same journals “Materials” and “Applied Sciences”.

Once again, this Special Issue was promoted by the Manufacturing Engineering Society (MES) of Spain [5], with the aim of covering the wide range of research lines developed by the members and collaborators of the MES and other researchers within the field of Manufacturing Engineering.

In this third edition, the joint issue has gathered a total of 31 papers in the topics presented in Figure 1, where the percentage of contribution of each topic to the Special Issue of the Manufacturing Engineering Society 2020 (SIMES-2020) is also shown.

Regarding the specific contributions of the Special Issue in the journal Applied Sciences, 14 papers about cutting-edge advances in different fields of manufacturing engineering have been finally published after a rigorous review process. In particular, in: advances and innovations in manufacturing processes [6]; additive manufacturing and 3D printing [7]; manufacturing of new materials [8]; Product Lifecycle Management (PLM) technologies [9,10]; robotics, mechatronics and manufacturing automation [11]; Industry 4.0 [12,13]; design, modeling and simulation in manufacturing engineering [14,15]; and manufacturing engineering and society [16–18]; production planning [19]. Figure 2 shows the main topics and their percentages in this journal.

Percentage of contribution of each topic to the total of the joint Special Issue

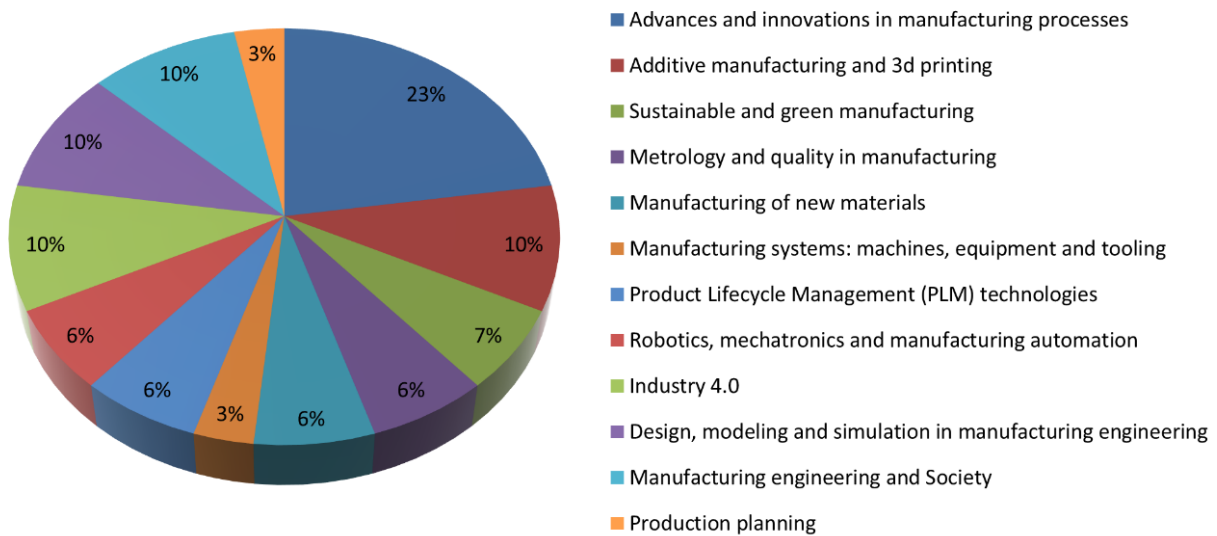


Figure 1. Percentage of contribution of each topic to the total of the joint Special Issue.

Percentage of contribution of each topic to the total of the Special Issue in the journal *Applied Sciences*

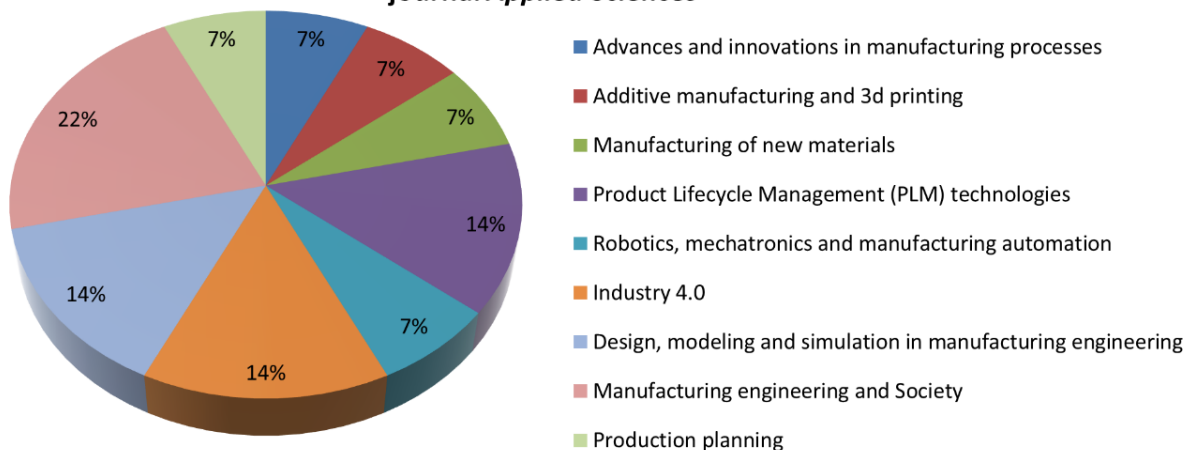


Figure 2. Percentage of contribution of each topic to the Special Issue in the journal *Applied Sciences*.

Among them, the topic “Manufacturing engineering and society” collects the highest number of contributions (representing 22%), followed by the topics “Product Lifecycle Management (PLM) technologies”, “Industry 4.0”, and “Design, modeling and simulation in manufacturing engineering” (each at 14%). The rest of the topics represents the remaining 35% of the contributions.

Concretely, within the topic “Manufacturing engineering and society”, in the field of cultural heritage, the work by Castillo et al. [16] presented a geomatics workflow that integrates hyperspectral remote sensing with photogrammetry and other traditional topographic techniques which offer an accurate method for the management and study of rock art; another interesting work in this field is by Martín-Béjar et al. [18], where a Strengths, Weaknesses, Opportunities, and Threats (SWOT) regarding the use of Unmanned Aerial Vehicles (UAVs) graphic applications in heritage assets was developed, along with a comparison between UAVs and conventional systems. Urgilés et al. [17] developed a proposal of methodology to improve the control and monitoring of complex hydroelectric power station construction projects that enables a periodical calculation of metrics for physical

progress, financial progress, and predictions for costs and durations on completion of the project, showing an improved efficiency compared with existing traditional methodologies.

Related to the topic “Product Lifecycle Management (PLM) technologies”, Gallego-García et al. [9] developed a maintenance and spare parts distribution model for increasing aircraft efficiency, with which managers are provided with a conceptual and simulation model for the assessment of future what-if scenarios based on aggregated databases from multiple sources, without delays and with a dynamic vision of the relevant relationships between factors. Likewise, Gallego-García and García-García, in their work [10], presented an optimization of inventory management for managers considering demand forecasting, procurement strategies, and different product lifecycles.

Focused on the “Industry 4.0”, an industry 4.0 roadmap with implementation for small and medium-sized enterprises was developed by Cotrino et al. [12], whereas Miqueo et al. [13] realized a systematic review about lean manual assembly 4.0.

The topic “Design, modeling and simulation in manufacturing engineering” also collects two papers in different fields. David et al. [14] study the influence of packaging design and placement at the point sale as some particular aspects of industrial design and their implications for society; and Martín et al. [15] have developed a model of triangular rigid zones on parts with horizontal symmetry as an application of the upper bound theorem to the analysis of forging processes.

The rest of the contributions addressed different topics. In the field of machining, Blanco et al. [6] determined the thicknesses/roughness relationship in drilling of Mg-Al-Mg and Mg-Ti-Mg hybrid component plates for aeronautical applications; and Sánchez et al. presented a new approach to the consideration and analysis of critical factors in robotic machining [11]. In the field of metal forming, the multi-material extrusion of bimetallic AZ31B-Ti6Al4V billets is analyzed in the work by Fernández et al. [8], leading to the definition of favorable conditions in this kind of process. In the topic “Additive manufacturing and 3D printing”, Muñoz et al. [7] evaluated the circularity of recycled PLA filaments for 3D printers. Additionally, Gallego-García and García-García presented a supply chain simulation case study as an applicative example of predictive sales and operations planning based on a statistical treatment of demand to increase efficiency [19], within the topic “Production planning”.

Only five months after the publication of the first work [17], all the papers present prominent activity in their “article metrics”; it is remarkable how some of the papers belonging to this Special Issue have more than nine hundred abstract and full-text views, and some have been already cited, which is clear evidence of the interest in all of these topics in readers of the journal Applied Sciences, in general, and scientists and professionals from the industry in particular.

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