Editorial

New Trends in Manufacturing Processes Research

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Research on manufacturing processes is further enriched and becomes stronger at the 47th North American Manufacturing Research Conference (NAMRC 47) at Penn State University, The Behrend College, Erie, Pennsylvania USA. Innovation is fundamentally connected to products or processes: the former being rarer and more difficult to be obtained, the latter is definitively related to economy, competitiveness and welfare of a nation. Furthermore, the research and success in innovation of processes permit also the proposition of innovative products. Manufacturing processes engineering is of primary interest for industries and new challenges are faced every day in order to reduce costs, increase complexity or functionality or simply quality of parts and products. Finally new and effective technologies and manufacturing processes are proposed or integrated to the existing ones to face these challenges and to get more ambitious targets.

This special issue entitled “New Trends in Manufacturing Processes Research” brings to readers the state-of-the-art and the latest developments presented at the 47th North American Manufacturing Research Conference (NAMRC 47) at Penn State University, June 10-14, 2019 in Erie, Pennsylvania, USA. The following nine quality papers are carefully selected from NAMRC 47 for inclusion in this special issue.

1. Multi-point coupling for tool point receptance prediction
2. Numerical Investigation of the Effects of Operating Parameters in the Vibration Assisted Nano Impact Machining of Single Crystalline Silicon by Loose Abrasive using Molecular Dynamics Simulation
3. Die-less fabrication of miniaturized parts through single point incremental micro-forming
4. An Experimental Study of Tensile Property Variability in Selective Laser Melting
5. Dynamics Modeling and Verification of a Large-Displacement Precision Preloaded-Flexure Stage
6. Experimental Study on Micro-drilling of Unidirectional Carbon Fiber Reinforced Plastic Composite Using Nano-solid Lubrication
7. Identification of machining parameters for trochoidal milling of Inconel 718 for minimum force and tool wear using the Taguchi method
8. Friction Stir Extrusion To Recycle Aluminum Alloys Scraps: Energy Efficiency Characterization
9. Colorizing Ti-6Al-4V Surface via High-Throughput Laser Surface Nanostructuring

These nine selected papers cover a broad range of research in manufacturing processes, including the processing of advanced materials, milling, turning, drilling, rolling, laser processing, ultrasonic processing, additive manufacturing and process simulation. As observed in the most recent year, conventional manufacturing processes are still relevant and of scientific interest; at the same time additive manufacturing in all its different aspects shows a definitively growing scientific and industrial interest.

Finally, we wish to take this opportunity to thank all the authors for complying with referees’ comments in revising their manuscripts and for their scientific contributions to make this special issue a success. This special issue defines the state-of-the-art technologies in manufacturing processes and opens new perspectives on the next future investigations and activities. Hopefully new developments and targets of interest for the international scientific community are coming in the next years.

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