



## Cellular Structures Design and Optimization for Additive Manufacturing: A Review

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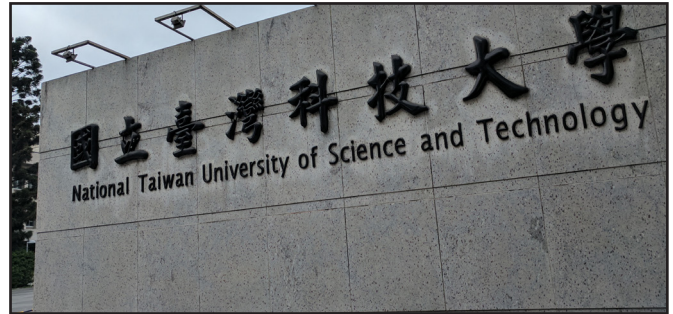
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### Abstract:

Cellular structures are largely found in nature such as wood, bones, cork, honeycomb etc., due to excellent properties, for example excellent energy absorption, high strength-to-weight-ratio, and lightweight. Cellular structures are made up of an interconnected network of plates (closed-cell structures), solid struts (open-cell structures) or small unit cells (periodic structures). When compared with traditional manufacturing processes, Additive Manufacturing (AM) has enabled the designers and engineers to fabricate intricate geometries having cellular structures for various applications in automotive, aerospace, biomedical, and footwear industries. All major industries have been exploiting the benefits of cellular structures due to their prevalence over a wide range of research fields. In this study, authors aim to present a comprehensive review of design, optimization, and AM of various cellular structure morphologies investigated by different researchers. In addition, the applications and properties of 3D printed structures, and the major challenges are presented. Furthermore, major gaps, limitations and new areas that needs to be investigated in cellular structures for AM area of research. This review would provide a more precise understanding and the state-of-the-art of AM with the cellular structures for engineers and researchers in both academia and industrial applications.

### Biography:

AAMER NAZIR has completed his PhD at the age of 30 years from National Taiwan University of Science and Technology (NTUST), and Postdoctoral Studies from High Speed 3D Printing Research Center (HS3DPRC),



NTUST, Taipei, Taiwan. He is presently working as Assistant Professor in the HS3DPRC, NTUST, Taiwan. He has published more than 08 papers in reputed journals and has been serving as a reviewer of some reputed journals.

### Publication of speakers:

1. Aamer Nazir et al ; Buckling and Post-Buckling Behavior of Uniform and Variable-Density Lattice Columns Fabricated Using Additive Manufacturing ,2019 Oct 29.
2. Aamer Nazir et al ; Thin Film Elastic Modulus of Degradable Tyrosine-Derived Polycarbonate Biomaterials and Their Blends, 2009 Jan 22
3. Aamer Nazir et al ; A Surrogate for Debye-Waller Factors from Dynamic Stokes Shifts, 2012 Jan 1
4. Aamer Nazir et al ; Proposed learning strategies of medical students in a clinical rotation in obstetrics and gynecology: a descriptive study, 2016 Nov 14
5. Aamer Nazir et al ; Low-Cost Carbon Fillers to Improve Mechanical Properties and Conductivity of Epoxy Composites, 2017 Nov 24

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