



2ND INTERNATIONAL WORKSHOP

ADDITIVE MANUFACTURING
AND SUSTAINABILITY

BOOK OF ABSTRACTS

IWAM 24



OCTOBER 4TH, 2024

Title: 2nd. International Workshop on Additive Manufacturing and Sustainability (IWAM): book of abstracts

Editors:

João da Rocha e Silva, Instituto Politécnico de Bragança, Portugal;

João Eduardo Pinto Castro Ribeiro, Instituto Politécnico de Bragança, Portugal

Jorge Santos, Instituto Politécnico de Bragança, Portugal

Rui A. Lima, Universidade do Minho, Portugal

Publisher:

Instituto Politécnico de Bragança

Campus de Santa Apolónia

5300-253 Bragança - Portugal

Publishing: 2025

ISBN: 978-972-745-347-4

Handle: <http://hdl.handle.net/10198/29735>

TABLE OF CONTENTS

Process Optimization of a Green Composite Containing a 3D Structure Produced via Additive Manufacturing..... 13

Artificial Intelligence for Additive Manufacturing: preliminary analysis of trends and challenges 14

Experimental Study of Green Nanofluids: Evaluation of Wettability, Viscosity, and Thermal Conductivity Properties 16

Increasing motivation and learning in digital manufacturing: Blended Intensive Programs for STUDENTS..... 17

3D Print Technologies Applied in Robotics Prototyping..... 18

Study of Electro Discharge Machining (EDM) to manufacture holes in Selective Laser Melted (SLM) parts. 19

Utilisation of feedstock material in additive manufacturing technology of ceramics by UV laser vat-photopolymerisation (VPP-UVL/C) 20

MEX and VPP-UVL Technologies for Printing Complex Alumina Parts 21

Design of a novel bi-phasic biomimicking auxetic 3d printed structure with fluids that biomimic the hysteretic behaviour of articular cartilage for medical phantoms..... 22

Developing optical mimicking phantoms of the head tissues – a new approach for transcranial photobiomodulation research..... 23

Optimization of PDMS Curing in SLA Resin Molds: Techniques and Approaches 24

Development of a hydrophone for measuring the propagation of acoustic waves in biological tissues 26

Development of wood and cork derivative panels for sustainable construction..... 27

Valorisation of Olive Mill Wastewaters for Industrial Applications 29

Progress on fire safety of sustainable timber construction 30

Effects of extensive green roofs on rainwater drainage from a metalworking industry building..... 31

Strategies for Modifying PDMS Wettability and Potential Applications 33

Microfabrication of a capillary-driven microfluidic device: Surface wettability 34

Microfabrication of a capillary flow-driven microfluidic plasma separator..... 35

Development and fabrication of a microfluidic device for mechanical characterization of malaria-infected red blood cells..... 36

3D Hollow microneedles fabrication for microfluidic applications..... 37

Linear transformations in an engineering course – Matrices and dynamic representations 39

Awareness of sustainability practices in construction: Learning in a real context 40

<i>Development of a helmet device for transcranial optomechanical stimulation to treat Alzheimer's disease</i>	<i>41</i>
<i>Acoustic stimulation based on piezoelectric materials enhanced anti-proliferative activity of triple-negative breast cancer cells</i>	<i>42</i>
<i>Study of the effect of the physical characteristics of bacterial nanocellulose on the proliferation of triple negative breast cancer cells.....</i>	<i>43</i>
<i>Collaborative work between Polytechnic Higher Education students: Manufacturing processes, Safety and Sustainability</i>	<i>44</i>
<i>Learning linear algebra with the MathE platform: an experience in a Mechanical Engineering course</i>	<i>45</i>
<i>Enhancing Realism in 3D Mapping Through Drone-Based Photogrammetry and Animated Elements.....</i>	<i>46</i>
<i>A Review of Best Methods for 3D Scanning and Modeling of Terrain and Buildings Using Drones and Photogrammetry.....</i>	<i>47</i>
<i>Mechanical analysis of specimens generated by 3D topological optimization</i>	<i>48</i>

Awareness of sustainability practices in construction: Learning in a real context

F. Silva^{1,2,3*}, A. Santos¹, Y. Rios¹, P. M. Barros⁴

¹ESTiG, Instituto Politécnico de Bragança, 5300-253, Bragança, Portugal

²GIcoS, Instituto Politécnico de Bragança, 5300-253, Bragança, Portugal

³GeoBioTec, Universidade da Beira Interior, 6201-001, Covilhã, Portugal

⁴Centro de Investigação em Educação Básica, Instituto Politécnico de Bragança, 5300-253, Bragança, Portugal

(*)**Email:** flora@ipb.pt

As part of the Higher Professional Technical Course in Civil Construction at a Polytechnic Higher Education Institution, a teaching experience was proposed in which the Technical Installations and Sustainability Practices in Construction course units were taught interconnectedly. The students mobilized the knowledge acquired in the first-course unit to carry out practical work on more sustainable solutions in buildings as part of the second-course unit. This experience allowed the students to apply their knowledge in scenarios close to their professional reality and to reflect on the complex issues of sustainability in construction.

Keywords: Hydraulics, Sustainability in construction, Higher education.