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**ACADEMIC INTELLECTUAL**  
INTERNATIONAL INVENTION,  
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# INNOVATION

## CATEGORY

## **3D PRINTED LOWER-LIMB SOCKET FOR PROSTHETIC LEG**

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The statistics of lower limb amputation is rising across the globe and continues to be a major threat to morbidity and mortality. In Malaysia, amputation prevalence has been increasing in which several main components of service delivering aspects such as service intervention and prosthetic personnel should be anticipated to accommodate for the increasing demand. In this project, the objectives are to (i) design a lower limb socket for amputated leg according to stump size and, (ii) analyze the performance of the socket at different thickness and infill settings and (iii) fabricate the lower limb socket using 3D Printing technology. The novelty of this project is the process involved in the fabrication 100% technology-based in order to achieve target of Industrial Revolution 4.0. Several phases of design involved including computational analysis and fabrication using 3D printing technology. The design stage will model the socket layers, which can be obtained from 3D scan or CT-scan images. The analysis stage will evaluate the performance of the product based on the material used and the set-up procedure conducted. Resulting stress and deformation were measured to propose the best design and will be fabricate using 3D printing technology by considering the best suit of material and set-up as per obtained in the analysis. It will give a huge impact biotechnology field and thus may open many job opportunities soon. It is believed to have high potential of commercialization as the processes are more accurate, faster and economical compared to the traditional prosthetic leg fabrication.



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