

IoP Print in Art, Industry and Science

Title:

Using Large-Scale Thermoplastic Additive Manufacturing as a Bridge Manufacturing Process in Response to Shortages of PPE During the COVID-19 Outbreak

Speaker:

Elizabeth G. Bishop, University of Warwick, UK

Bio:

Elizabeth is a Postgraduate Researcher (PhD Student) and Teaching Fellow at the University of Warwick researching Large-Scale Additive Manufacturing. Elizabeth has been interested in 3D printing for several years now, investigating research topics across a wide range of applications for Fused Filament Fabrication, from mould tooling to direct part manufacture in the aerospace and automotive industries. More recently her focus has been on Large-Scale Additive Manufacturing, the difficulties surrounding this emerging technology and its exciting applications. Elizabeth is also a Maker in Residence in the Engineering Build Space at Warwick University where she is exploring making, CAD and CAM alongside 3D printing.

Abstract:

The global COVID-19 pandemic led to an international shortage of personal protective equipment (PPE), with traditional supply chains unable to cope with the significant demand leading to critical shortfalls. A number of open and crowd-sourcing initiatives sought to address this shortfall by producing equipment such as protective face shields using additive manufacturing techniques such as fused filament fabrication (FFF). This talk will outline the process we used to design and manufacture protective face shields using large-scale additive manufacturing to produce the major thermoplastic components of the face shield. The technology offers significant advantages over other additive manufacturing technologies in bridge manufacturing scenarios, acting as a true transition between prototypes and mass production techniques such as injection moulding. In the context of production of COVID-19 face shields, the ability to produce the optimised components in under five minutes compared to what would typically take one to two hours using another additive manufacturing technologies meant that significant production volume could be achieved rapidly supporting the local community, front-line workers and the University staff and students.