Open source user driven design 3d printed sample holders for 3D imaging

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The biological world is in essence a three-dimensional endeavour and since a few years there has been an extensive development of 3D imaging techniques to acquire every model in its full. From Optical Projection Tomography to Light Sheet Fluorescence microscopy, those technologies allow users to mount nearly any sample they want without using a slide-based protocol. However, manufactures and companies did not keep up with this pressing demand for mounting samples like insects, organoids or entire tumours in a 3D dimension system. Many communities rely on home-made recipes and DIY approaches that have limited life span. Here we present an interactive system using open source software OPEN SCAD for user to design their own sample holder then produce at will using additive manufacturing systems. Moreover, we define for the first time the sample movement space that allows for precise design parameters whatever the system you plan to use. Finally, we show several examples on commercial and homemade system as well as a database of filaments available and their chemical resistance even for clearing solutions. This project aims at empowering users and commercials entities to take full advantages of the new 3D imaging modalities as a community as every design can be exchange and share.