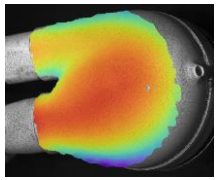
Tomasz Rusin

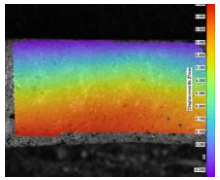
Advances in Digital Image Correlation in biomaterials testing

Scientists and engineers in biomaterials research rely on accurate measurements to make breakthroughs in applied research, technology development, and quality assurance.
Chief among the challenges faced in biomaterials research is that many specimens have complicated geometry and often are very small and sensitive – therefore it is extremely difficult to measure their deformation and strain.
Digital Image Correlation (DIC) is perfectly suited for biomaterials tests and micro specimens, measuring 3D displacement and strain and many other material parameters.
In some applications, standard strain gauges can not be used for various reasons such as fragile or thin materials or the need to obtain a full field measurement of the object without the need to mount numerous gauges.
The most popular optical method is 3D Digital Image Correlation (DIC) which uses stereoscopic imaging and analysis to obtain strain measurements results over the test sample.

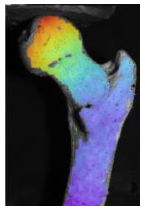
Cardiac surgery and cardiovascular research



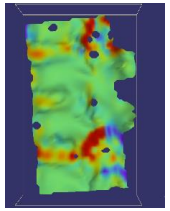
Soft tissues and hydrogels



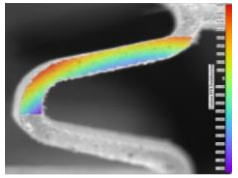
Bones



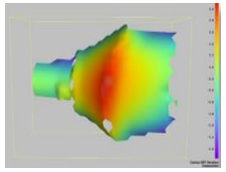
Spine implants and stabilisers



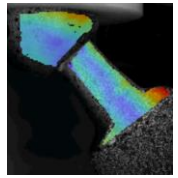
Stents



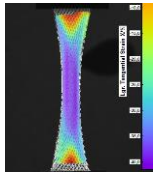
Dental implants



Implants



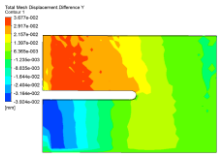
Biomaterials



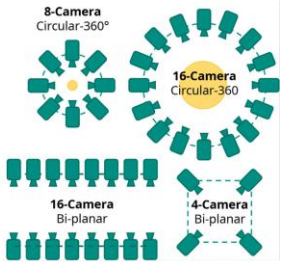
DIC for standard size specimens from 1m to 10mm

Micro DIC for specimens from 10mm to 0.1mm

DIC for experimental FEM validation



360º perspective for material testing of complex shapes and structures



- Biomaterials
- Medical device components
- Orthopaedic implants (e.g. Hip, Knee)
- Soft tissue
- Bones and bone microstructure
- Dental materials (e.g. Fillings, Crowns)
- Stents (e.g. Coronary, Vascular, Ureteral)
- Hydrogels
- Surgical microtools
- 3D Printed materials
- Shape memory materials
- Skin and skin grafts

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