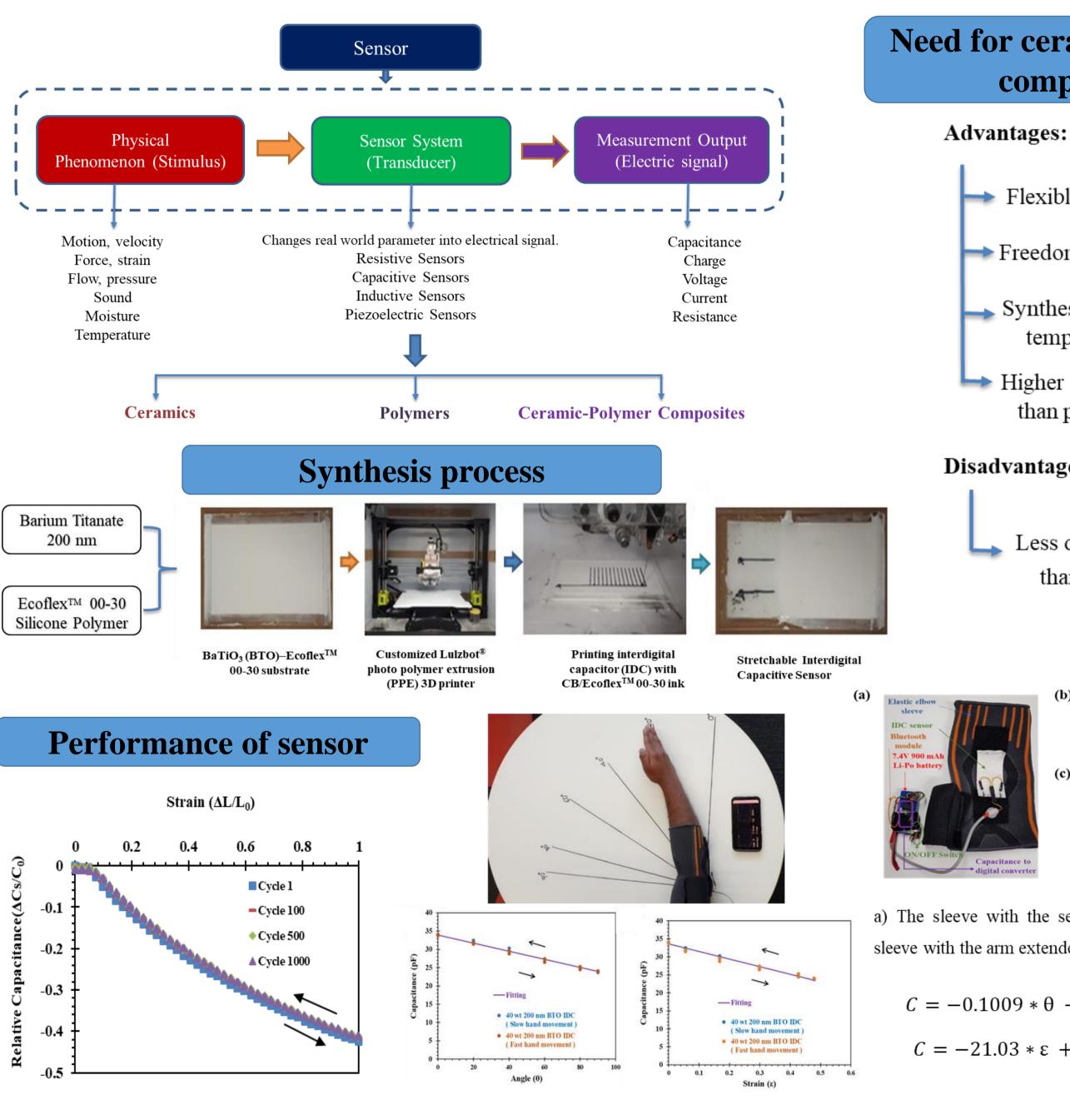


Highly stretchable capacitive strain sensor enhanced with Barium Titanate silicone elastomer composite Eshwar Reddy Cholleti (Ph.D in Mechanical Engineering : Thesis submitted)

Supervisor: Assoc Prof Kean CAw;

Co-Supervisor: *Dr Jonathan Stringer* ;



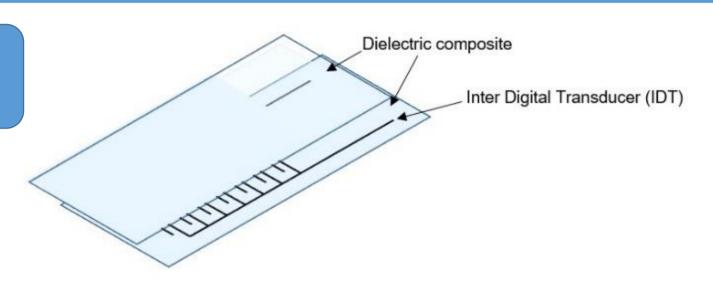
Co-Supervisor: *Prof Christoper Bowen (University of Bath, UK)*

Need for ceramic-polymer composites

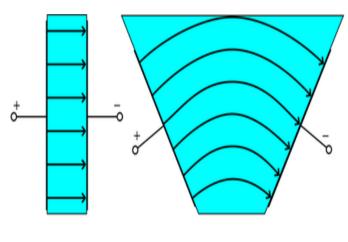
- → Flexible
- ➡ Freedom of design
- → Synthesis at room temperatures
- → Higher dielectric constant than pristine polymers

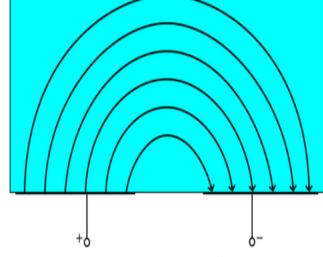
Disadvantages:

Less dielectric properties than ceramics



Stretchable capacitive sensor with IDT





Gradual transition from a parallel plate capacitor to a planar capacitor

Applications



a) The sleeve with the sensor and Bluetooth module, (b) The sleeve with the arm extended, (c) The sleeve with the elbow bent.

- $C = -0.1009 * \theta + 33.88$ (with R-square = 0.982)
- $C = -21.03 * \varepsilon + 33.6$ (with R-square = 0.99)



Sport performance monitoring d wirelessly activated fully soft robotic syste

Activating e-skin (actuating part)



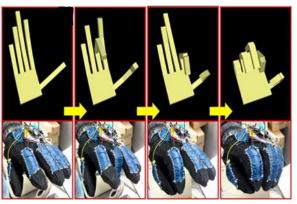
Stretching



Basic Motion



Reload



Soft robotics

Gaming and virtual reality