Design and Development of an intelligent extrusion device for 3D printing of concrete structures– DST

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Theme: Development of extrusion device for 3D printing of concrete structures

Objective:

- The main objective is to design and develop an intelligent device for simultaneous extrusion of concrete and reinforcement materials with in-situ mixing. Other objectives are as follows:
- To use 3D concrete printing device for training of additive manufacturing in educational institutes.
- To popularize sustainable and aesthetically appealing concrete furniture in public places

Deliverables:

- Research publications/patents,
- Two prototypes: (1) Miniature Conprint Extruder (2) Industrial Conprint Extruder
- Material design and optimal process parameter settings to obtain rapid hardening fiber reinforced concrete

Current Status:

- We are currently developing suitable strategy for smooth extrusion of cement paste. The mix design is not finalized yet. However, we have achieved continuous printing of filament using 2 extrusion mechanisms with our trail mix.

Extruder prototype for cement paste printing