

# Press release

19 February 2021

## A robotic cell to print electronic circuits on the surface of 3D objects

On January 29, 2021, Gioia Furia defended a doctoral thesis from the University of Grenoble Alpes prepared at LGP2 under the supervision of Davide Beneventi, CNRS Research Director, and Professor Didier Chaussy (Grenoble INP-Pagora / LGP2) and the co-supervision by Philippe Marin, Associate Professor (Grenoble INP / G-SCOP).

Gioia Furia presented the results of her research entitled *Development of a robotic cell for printing electronic circuits on the surface of 3D objects and industrial applications*.

Objective: to produce a 6-axis robotic cell to print electronic circuits on objects of any shape, suitable for prototyping and the production in small series of 3D objects integrating surface electronics.

The proposed manufacturing method includes several phases: digitization, mesh construction, circuit projection, speed analysis and printing. This flexible process is very useful for prototyping and small series applications where it is necessary to frequently change the substrate and the dimensions of the 3D object.

An offline programming approach allows to print conductive trajectories on 3D objects and to automatically generate the trajectory and program of the printing robot. A methodology to predict the morphology of the circuit by adapting the projection parameters according to the trajectory and the speed of the 6-axis robot has been designed.

An interface dedicated to the management of the entire process, from circuits design to the automatic generation of the printing program, has been created thus allowing operators not expert in robotics to use the cell.

Finally, prototypes were presented.

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**Logo** [logo-lgp2.eps](https://logo-lgp2.eps)

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