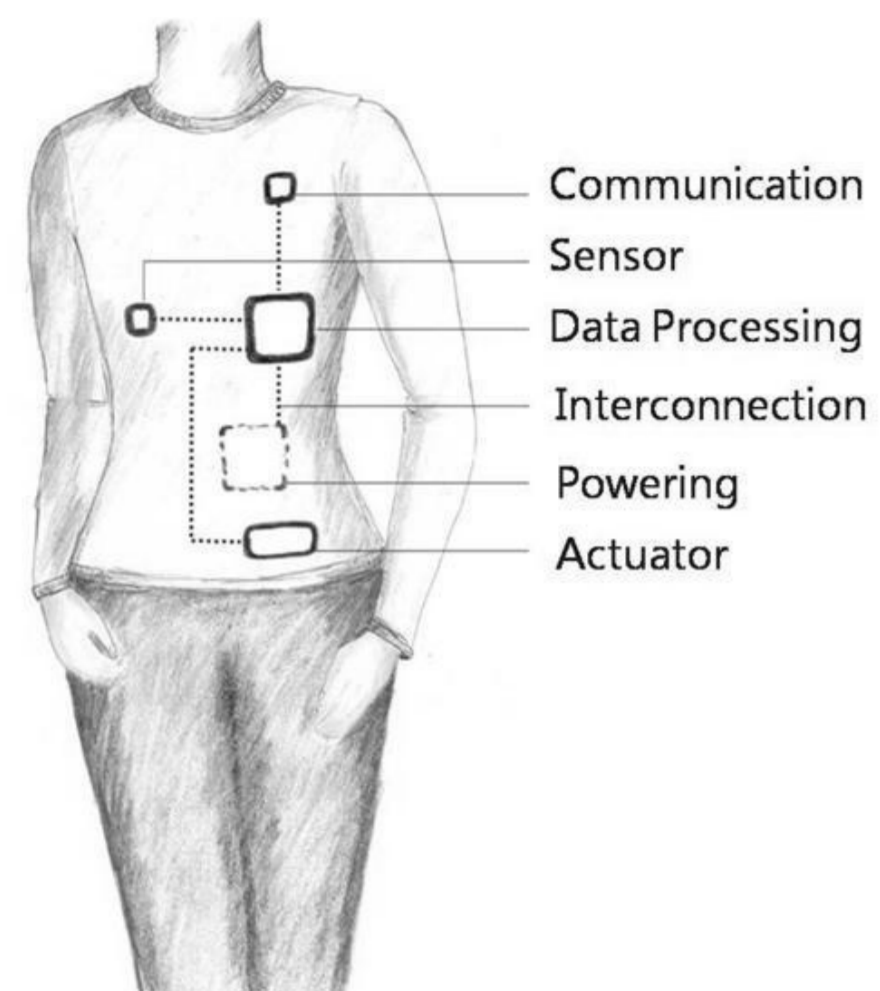
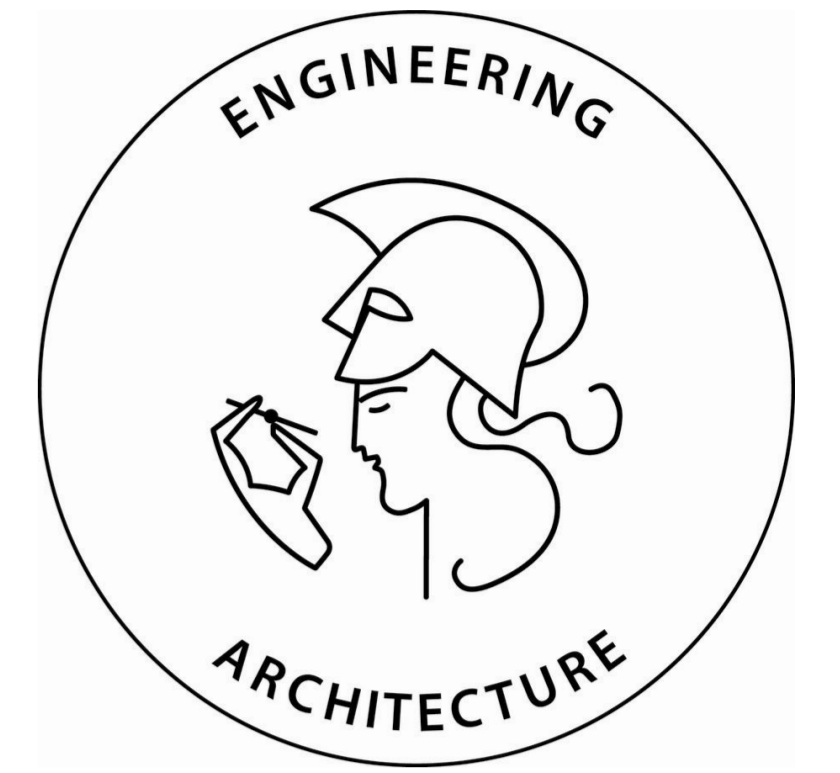


# Topsy-Turvy Technology: when your shirt tells you to go jogging

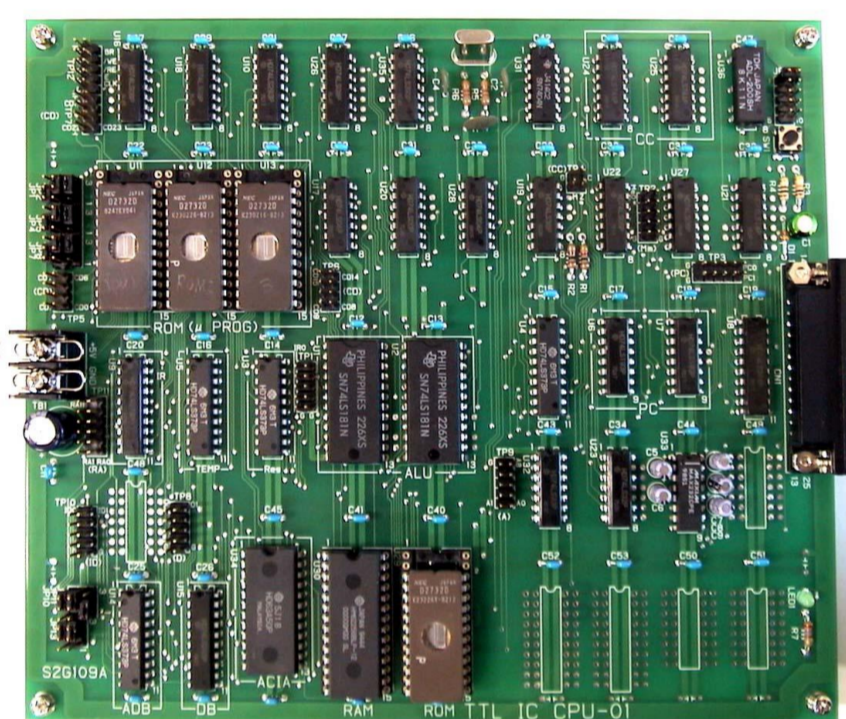


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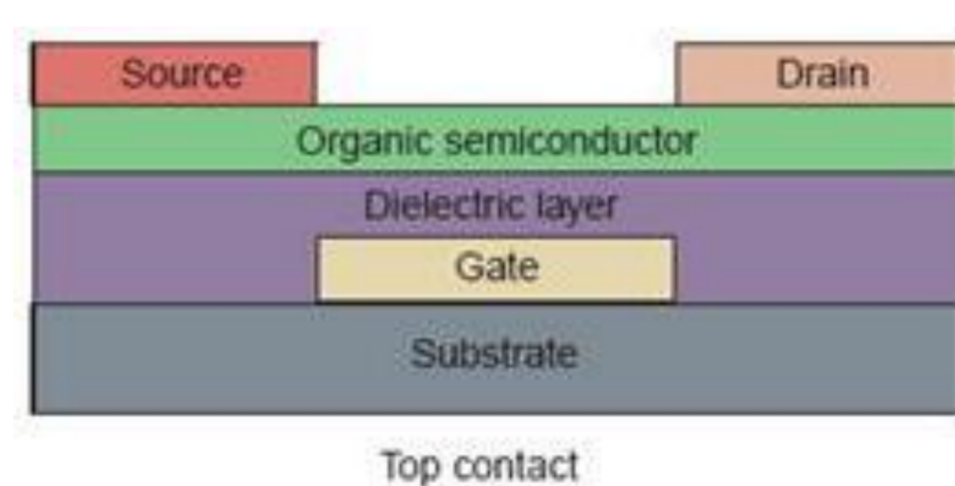


Synthesis and characterisation of Copper, Polyimide and TIPS-pentacene layers in the development of a solution processed

## Fibrous Transistor



For manufacturing of fully integrated flexible electronics, the development of fibrous flexible transistors is a prerequisite. If used as electrical switches, fibrous transistors would enable making electrical circuits directly on fabric level. Transistors could also be used as sensors for external stimuli such as chemicals, heat, radiation or motion. Main areas of application are in the medical field for monitoring, permanent treatment and rehabilitation via electro-stimulation. Sports, military and civil security are other important fields of interest.

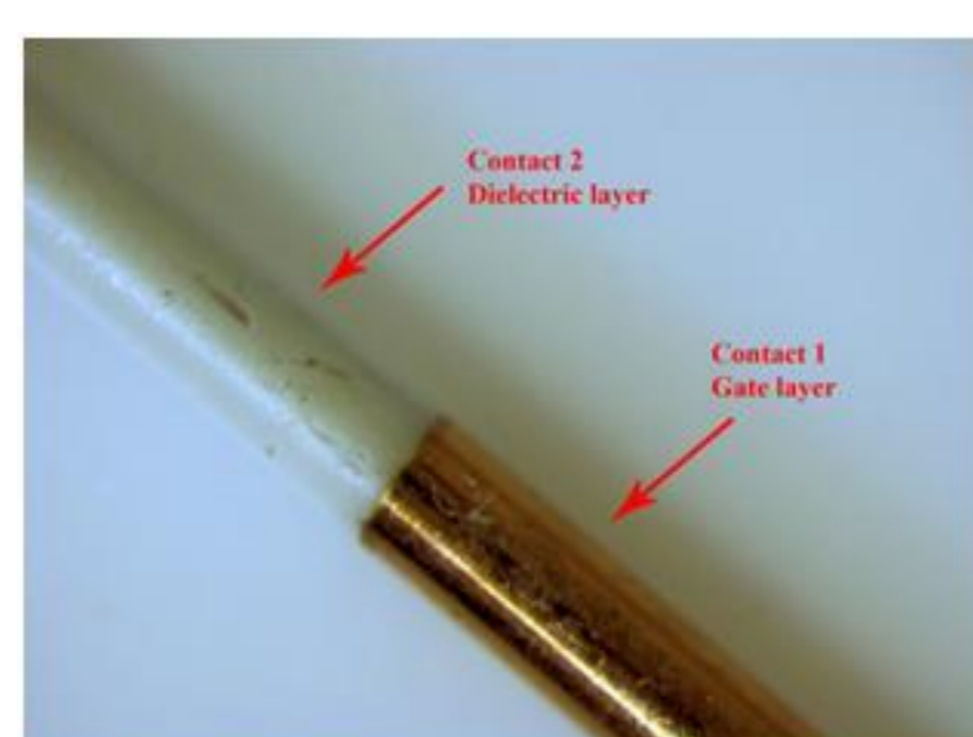
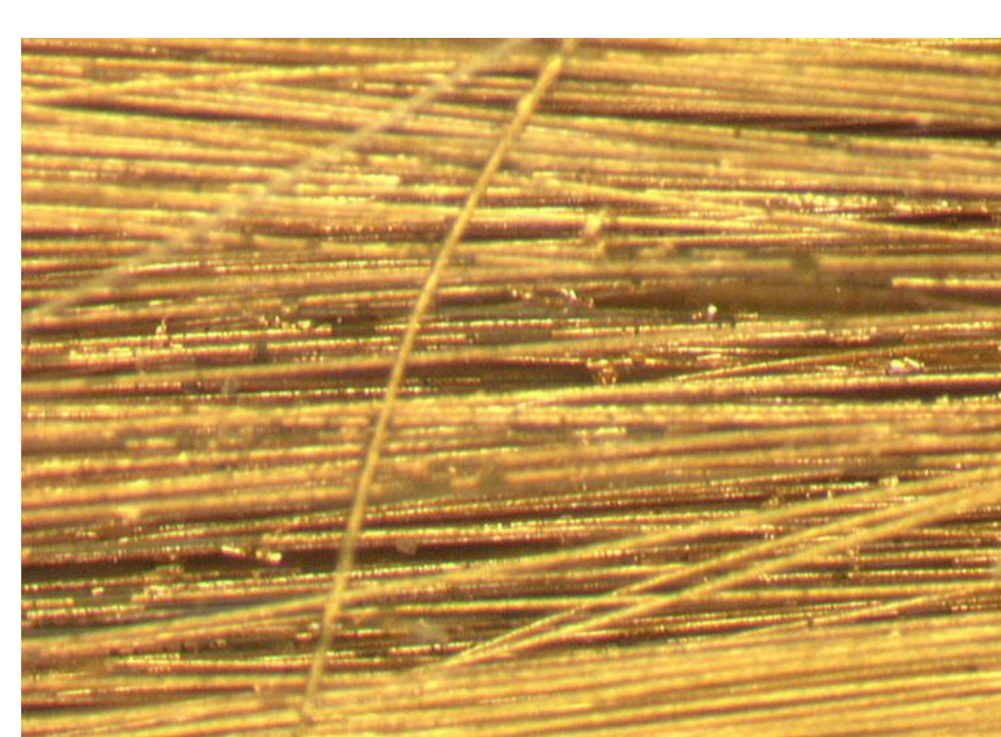
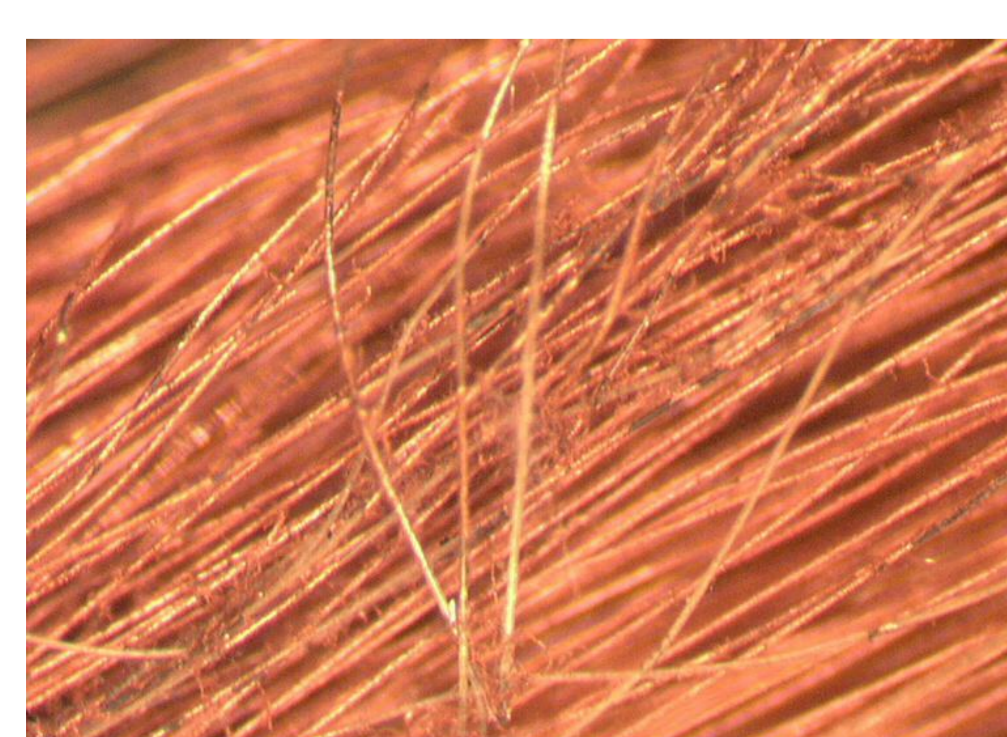
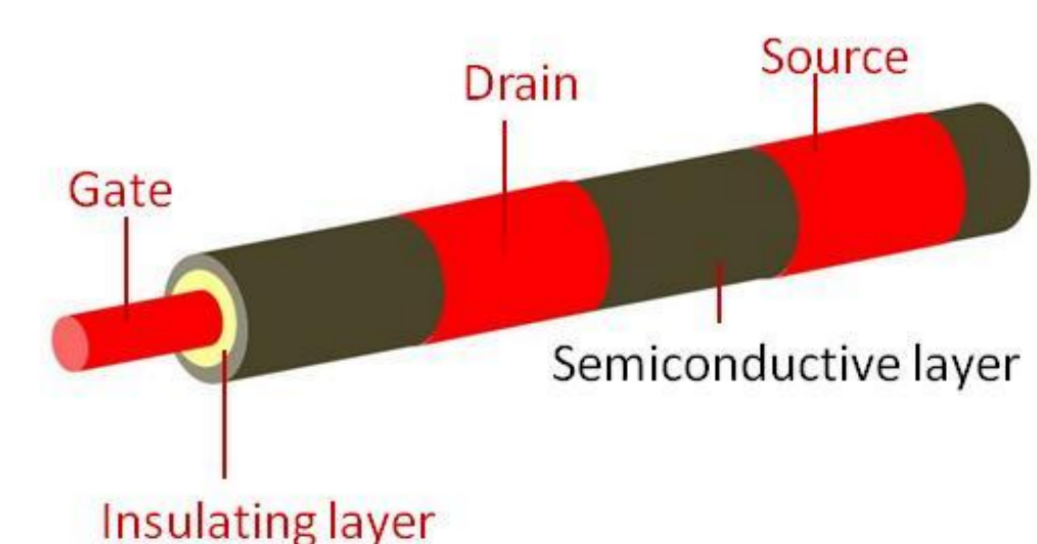


A study was made for the development of a flexible organic field effect transistor. The respective layers deposited on the textile substrate (polyester fibre) are:

- gate = pyrrole + copper (+ gold)
- dielectric = polyimide
- semiconductor = TIPS-pentacene
- source/Drain electrodes = gold

With focus on low temperature soluble processes to allow up-scaling, different deposition techniques have been examined.

The gate layer was applied by electroless deposition of pyrrole and copper. A reproducible result has been obtained and the process is well understood. Development of a good dielectric layer and application through dip-coating, is a difficult component in realization of a transistor. Major improvements have been made, but still some questions have to be answered. The semiconductor layer is still under investigation. Deposition of gold electrodes was achieved by vacuum evaporation.



### Questions?

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