



Optoelectronic Devices from Polymers

Researcher

Dr. Rafi Shikler

Department of Electrical and
Computer Engineering

Research

Prof. Shikler's group studies electronic and optical processes in optoelectronic devices based on polymers and organic molecules, in order to fabricate new devices and new architectures for operating devices.

We approach the task from three different angles: In the first, we study degradation processes in organic devices such as organic solar cells, organic light emitting diodes, organic transistors and organic flash memories. We employ an atomic force microscope in combination with a Raman spectrometer to detect chemical changes with high spatial resolution. We have already developed a new approach to surface-enhanced Raman spectroscopy that allows selective vertical studies on degradation processes in organic devices with vertical structures such as OLED and OSC. We also study charge retention in organic flash memories in order to develop improved architecture for information storage.

The second angle focuses on the integration of different optoelectronic devices to form a new device. We are part of a joint project working on combining an IR detector with an OLED structure for a night vision system, where we are responsible for the fabrication of the OLED and its integration with a transparent cathode. We are also working on combining organic solar cells with an organic thin film transistor for light detection.

The final angle focuses on the study of new materials for devices.

Applications & Products

Optoelectronic devices based on polymers and organic molecules:

- OLED
- Wave guides
- Magnetic, light and pressure sensors
- Organic flash memory
- Large-scale organic photovoltaic