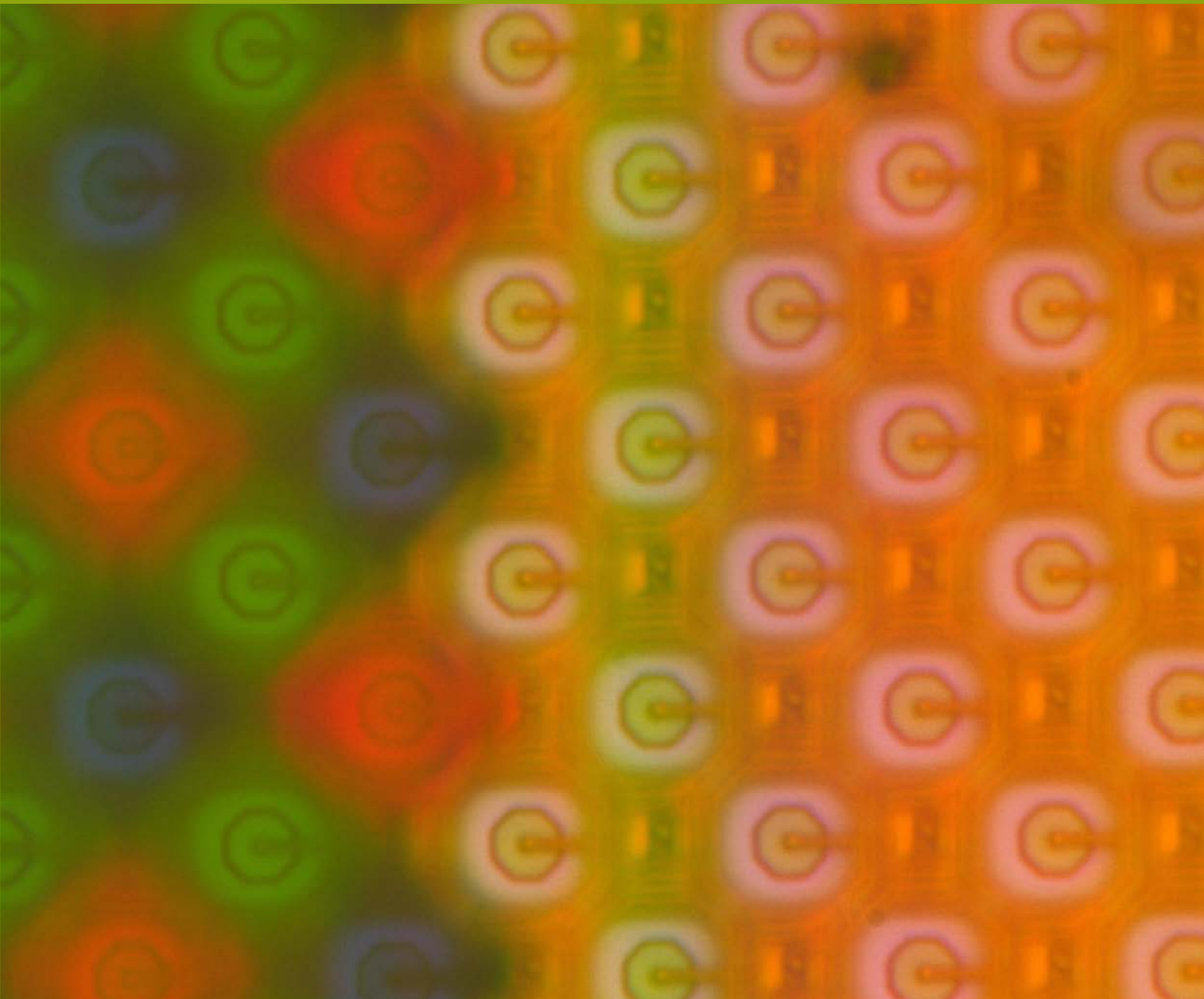
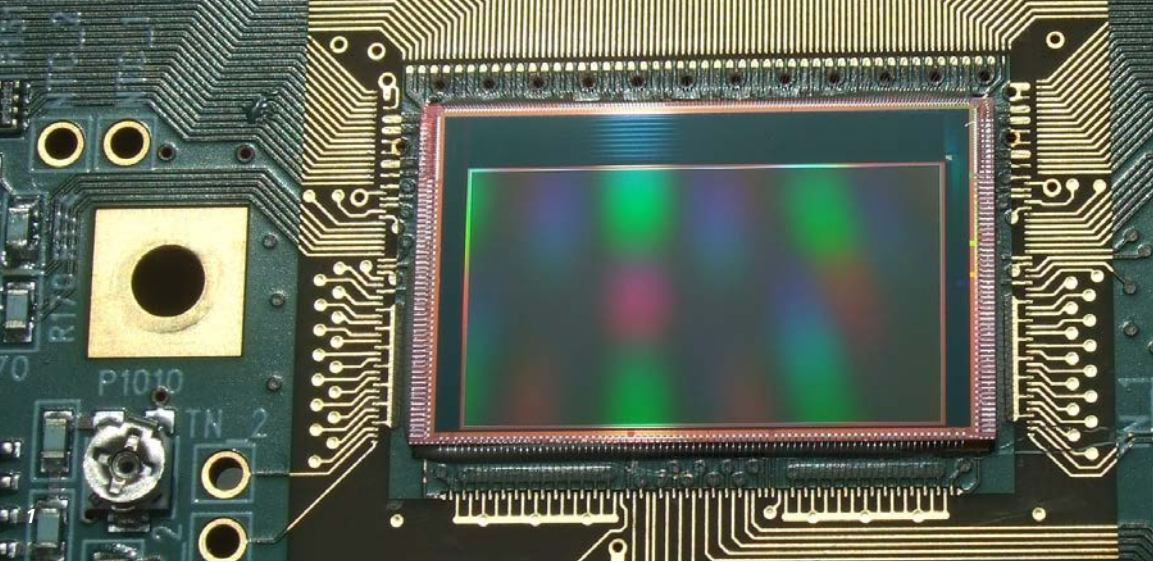


CMOS IMAGE SENSORS AND CAMERA SYSTEMS





1 CMOS image sensor: High speed
2880x1620 pixels @ 1000 fps

2 High speed camera

CMOS IMAGE SENSORS

The IC-Design department at Fraunhofer IIS develops CMOS image sensors in close collaboration with other departments. Our main focus are CMOS image sensors with special form factors. The R&D range spans ultra small image sensors (< 1 mm edge length) as well as image sensors for industrial imaging applications with high resolutions and high frame rates (1000 fps and beyond). We are working closely with semiconductor manufacturers, who, by extending standard CMOS processes, enable increased light sensitivity and lower dark currents. Using pinned photo diodes allows to design ultra low-noise sensors.

CORE COMPETENCIES

Sensor Design

- Sensors with custom geometry (number of pixels, pixel size)
- Pixel architectures (4T pinned photo diodes, 5T global shutter)
- Customizable region of interest and frame rate
- Analog and digital sensor outputs
- Integrated processing (e.g. dark current subtraction)
- High frame rates
- Global or rolling shutter
- Analog-digital converters specifically adapted to image sensors
- Customizable pixel pattern
- Customizable filters: Bayer RGB, modified Bayer RGB, micro lenses, polarization filters, spectral filters

CURRENT RESEARCH INTERESTS

- Analog-digital converters for image sensors
- Image sensors for x-ray imaging



CAMERA SYSTEMS

The Electronic Imaging department designs customer-specific camera systems for industrial and medical imaging applications as well as for the film and broadcast markets. Our areas of expertise cover the entire signal chain, starting with the image sensor, to the design of custom-tailored image processing algorithms, the development of signal processing hardware and software, and finally, software for intelligent image analysis.

CORE COMPETENCIES

Image Sensors

- Initial setup and operation
- Evaluation
- Application
- Structural design
- Casing
- Thermal management

Camera Systems

- Design and implementation of prototypes
- Hardware development (analog and digital circuitry, high-end and high-speed PCB design)
- Firmware (FPGA, DSP, microcontrollers)
- Software (interfaces, drivers, GUIs, image processing)
- Algorithms (De-bayering, color space transformation, color optimization)

WE OFFER:

- CUSTOMIZED IMAGE SENSOR DESIGN
- CUSTOMIZED CAMERA DEVELOPMENT
- SOFTWARE FOR CAMERA CONTROL AND IMAGE DATA VISUALIZATION
- APPLICATION SPECIFIC IMAGE PROCESSING ALGORITHMS
- OPTICAL TEST SYSTEMS
- ONE-STOP SHOP FOR TURNKEY CAMERA SYSTEMS DEVELOPMENT

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