Custom CMOS Image Sensors: for earth observation and space

Renato Turchetta (CEO)
renato.turchetta@imasenic.com
Barcelona, Spain
The company

- Young, dynamic, innovation-led company
- Design of custom CMOS image sensors (CIS)
- Teams from scientific/medical and consumer markets
- Experienced in designing for demanding performance
- Partnering with leading technology companies around the world to provide optimized supply chain
Our offering

- Initial concept
- Specifications
- CMOS design
- Manufacturing
- Silicon sampling
- Packaging
- Camera module
- Supply chain management
- Volume production

1st time-right
Applications

MEDICINE

SCIENCE

EARTH OBSERVATION

SECURITY

BIOLOGY

SPACE / AERONAUTICS

INDUSTRIAL

AUTOMOTIVE
Visible light and beyond ...

... and particle detection
Camera-on-a-chip

Custom pixels
Low power ADC
High speed serialisers
On-chip programming
Sensing options.

- Manufacturing in advanced CIS technology down to 65 nm
- **Large sensors up to** wafer-scale sensors, on 200 and 300 mm diameter wafers
- Rolling shutter (down to 1.12 µm) and global shutter (down to 3.2 µm) pixels
- Back-side illumination (BSI) for high quantum efficiency
- Low noise: 1 e- rms
- High Dynamic Range (HDR) pixels: lateral overflow → 20 bits linear
- **Radiation-hard sensors**
- **High speed sensors**
- **Hyperactive pixel**
- **3D sensing**
Large format sensors

- Wafer-scale (200 and 300 mm diameter)
- Design optimised for high yield

• High speed, low power:
  video rate on
  12cm x 12cm, 6.7 Mpixel sensor

- 16 Mpixels
  video rate,
  6cm x 6cm size

Video rate,
wafer-scale,
14cm x 24cm

Courtesy of Rutherford Appleton Laboratory
Radiation hard design

- Total dose resistance
  - Deep submicron technologies (<250nm)
  - Radiation hardening by design

- Single Event Upset (SEU)
  - Triple voting system
  - Design for latch-up prevention

(a) NMOS transistors with various gate widths and a minimal gate length of 0.18 μm
(b) NMOS transistors with various gate length and a fixed gate width of 10 μm
Fast and ultra-fast, high-resolution sensors

Physics limit (for silicon)
3D imaging

• Single Photon Avalanche Detectors → Direct Time-of-Flight (TOF)

• Ultra-high speed sensors → millions fps at Mpixel res.

• Pixel wise coded aperture

• Time pixel multiplexing
Hyperactive (smart) sensors

- Add functionality into focal plane to the pixel: e.g. feature extraction, neuromorphic vision, timing option
- High transistor count
- BSI technology and stacked technology enable high performance smart sensors
- 80MHz, flash-detecting sensor
Conclusion

• IMASENIC is a growing company, fueled by innovation

• We offer sensor solutions for a diverse range of imaging applications

• 1st-time right design to shorten time-to-market

• We help customers to differentiate their product

• Wide range of solutions: come and talk to us with your ideas / needs
Thank you!

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Your next CMOS imaging solution

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