Gobinath Jegannathan
Curriculum Vitae

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DOCTORAL RESEARCH

"Current-assisted SPADs in conventional CMOS process"

For the PhD research, I initially started with research focus on CMOS drivers that can drive a laser to emit very sharp (<1 ns) and high power (>10 W) pulses, which can be used in direct time-of-flight (dTOF) applications. A few months later, due to new ideas and opportunities, I shifted the primary research focus towards a novel single-photon avalanche diode (SPAD) receiver for (dTOF). We came up with the concept of a "current-assisted" SPAD which promises enhanced near infrared sensitivity combined with high speed. Since then, I have been simulating, making variants and characterizing them. A few successful candidate structures for CA-SPADs have be already identified and have been published in peer-reviewed publications and presented at the Single photon workshop 2019.

WORK EXPERIENCE

SEPTEMBER 2021 – PRESENT (FT)

Vrije Universiteit Brussel
Postdoctoral researcher

CMOS based ToF sensors using SPADs.

SEPTEMBER 2016 – AUGUST 2021 (FT)

Vrije Universiteit Brussel
PhD researcher

Current-assisted SPADs in conventional CMOS process.

JULY 2013 – AUGUST 2014 (1 YEAR PROJECT)

Tata institute of fundamental research, Mumbai
Junior research fellow

Fabrication and characterization of graphene-TMDC hybrid structures.

EDUCATION

2016 – 2021	**Doctor of Philosophy** ELECTRONICS ENGINEERING Highest distinction (Top 5 %) *Vrije Universiteit Brussel*	
2014-2016	**Master of Science** Photonics Engineering *Ghent University and Vrije Universiteit Brussel*	
2009-2013	**Bachelor of Technology** Nanotechnology *SRM University*	

SKILLSET

Full CMOS process pipeline: Device physics simulations for sensor pixel, SPICE simulations for readout circuitry, Layout, Test PCB design, Wirebonding, Design of experiments, Experiment automation using python, Device characterization, data analysis and reporting.

Programming: Python for data analysis and measurement automation, MATLAB, C#, Basic working knowledge of VHDL.

In addition, I have hands-on experience in working with nanodevice fabrication in a class-100 cleanroom during my time at TIFR. Some selected skills include e-beam lithography, electrode formation using physical vapor deposition, sputtering and atomic layer deposition.

PATENTS

2016	**CMOS VCSEL driver** US10250011B2	
2018	**Current-assisted SPAD** US20200144436A1	

SELECTED PUBLICATIONS

Jegannathan, G. et al (2021). An Overview of CMOS Photodetectors Utilizing Current-Assistance for Swift and Efficient Photo-Carrier Detection. *Sensors*, doi.org/10.3390/s21134576

Jegannathan, G. et al (2020). Current-Assisted SPAD with Improved p-n Junction and Enhanced NIR Performance. *Sensors*, doi.org/10.3390/s20247105

Jegannathan, G. et al (2020). Current-Assisted Single Photon Avalanche Diode (CASPAD) Fabricated in 350 nm Conventional CMOS. *Applied sciences*, doi.org/10.3390/app10062155

Full list here

CONFERENCE PRESENTATIONS

Jegannathan, G. et al (2019).Current-assisted single photon avalanche diode (CASPAD) in 350 nm CMOS *Single Photon Workshop 2019, Milan.*

REFERENCES

Available on request