

Saikrishna Reddy Konatham

Seeking research positions in the area of integrated microwave photonics.

Skills

- Solid knowledge on high-speed test and measurement instrumentation, characterization of photonic components.
- Good experimental skills, and theoretical understanding of fiber optic communication systems, impairment analysis and performance metrics.
- Good understanding of coherent optical transceivers, modulation formats (e.g., QAM), multi-carrier techniques (e.g., OFDM).
- Good programming skills in Matlab, VB .NET.
- English communication skills, scientific publishing, technical presentations, documentation.
- Passionate about building products, problem solving/debugging, working in cross-functional teams.

Work Experience

- **Scuola Superiore Sant'Anna/CNIT** Pisa, Italy
Research Fellow Dec. 2023 – Present
 - System level feasibility study through VPI simulation, and experimental demonstration of Radio over Fiber (RoF) at E-band and higher frequencies.
 - System level design of Tunable Optoelectronic Oscillator (OEO) architectures with harmonic operation, employing frequency divider. This project involves initial system level simulations using VPI software, to translate the key performance indicators of an OEO into its component specifications. It will also involve experimental demonstration of a silicon photonics based OEO and performance characterization, when the fabricated chip is ready.
- **Infinera** Ottawa, Canada
Senior Hardware Development Engineer Nov. 2021 – April 2023
 - Testing of coherent pluggable transceiver prototypes, and providing feedback to various stakeholders in product/manufacturing.
 - Translating the VB .NET optical calibration test sequences (e.g., modulation loss calibration) from previous generation to the latest coherent pluggable modules.
 - Hands-on experience working in the Infinera's state-of-the-art optical systems, digital-optical integration lab in Ottawa.

Education

- **Institut National de la Recherche Scientifique (INRS)** Montreal, Canada
PhD in Telecommunications May 2016 – Oct. 2021

Thesis topic - Photonics-based real-time spectrogram analysis and processing of optical waveforms.

The fast Fourier transform (FFT) algorithms are versatile signal processing tools. The real-time DSP computation of FFT becomes cumbersome, especially when speed requirements (FFTs/second) are in the GHz range and above. My PhD thesis proposed a novel analog signal processing approach using frequency combs, referred to as time-mapped spectrogram that is suitable for real-time Fourier transform computations above the GHz range. Photonic implementation of the concept has enabled real-time spectral analysis at record bandwidth and time resolutions.
- **Indian Institute of Technology (IIT) Madras** Chennai, India
MS by research in Electrical Engineering Jun. 2012 – Jul. 2015

Thesis topic - Advanced modulation formats in passive optical networks.

Experimentally investigated duobinary coding, direct detection OFDM for passive optical networks.

Internships

- **COPL, University of Laval** Quebec, Canada
Visiting student May 2019 – July. 2019
 - Conducted experimental research on microwave photonics based real-time interference detection.
- **Indian Institute of Technology (IIT) Madras** Chennai, India
Research project associate July. 2015 – Jan. 2016
 - Assisted in setting up optical communication laboratory. Taught course on optical communications.
 - Studied the performance of OFDM when directly modulated on semiconductor lasers.

- Studied the effect of semiconductor optical amplifier nonlinearities on the performance of OFDM.

Awards/Recognition

- Research featured in the Optica (formerly OSA)'s Optics and Photonics News magazine December issues in the year 2020 and 2022.
- Corning outstanding student paper award at OFC 2020 (among 6 finalists)
- Best student paper award OSA Signal Processing in Photonic Communications (SPPComm) 2019
- Incubic Milton Chang student grant for presenting at CLEO 2020
- Post-deadline paper at IEEE photonics conference 2018
- Merit scholarship for foreign students (PBEEE) Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) for PhD studies.

Selected publications

1. **S. R. Konatham**, R. Maram, L. Romero Cortés *et al.*, “Real-time gap-free dynamic waveform spectral analysis with nanosecond resolutions through analog signal processing,” *Nature Communications* **11**, 3309 (2020). [**Featured in Optica OPN magazine ”Optics in 2020”**].
2. **S. R. Konatham**, H. G. de Chatellus, and J. Azaña, “Photonics-based real-time spectrogram analysis of broadband waveforms,” *J. Lightwave Technol.* **38**, 5356–5367 (2020). [**Invited**].
3. B. Crockett, L. Romero Cortés, **S. R. Konatham**, and J. Azaña, “Full recovery of ultrafast waveforms lost under noise,” *Nature Communications* **12**, 2402 (2021). [**Editors highlight**] [**Featured in Optica OPN magazine ”Optics in 2022”**].
4. **S. R. Konatham**, B. Crockett, L. R. Cortes, J. Azaña, “On-the-fly continuous time varying frequency filtering of broadband microwave signals,” 45th European Conference on Optical Communications (ECOC 2019), Sept. 22-26 2019, Dublin, Ireland.
5. S. Aneesh, **K. S. Reddy**, D. Venkitesh *et al.*, “Polarization division multiplexed-duobinary modulation format for long-reach passive optical network,” *Optical and Quant. Electron. (Springer)* **48**, 284 (2016).
6. **S. Reddy**, D. Venkitesh, C. Browning, L. P. Barry “Demonstration of a 30 Gbps intensity modulation direct detection OFDM-based passive optical network” in *2015 Twenty First National Conference on Communications (NCC)*, (2015), 1-4.
7. **S. Reddy**, C Browning, SP O’Duill *et al.* “Investigation of the performance of a 25 Gb/s OFDM-PON employing a semiconductor optical amplifier” in *2014 OptoElectronics and Communication Conference (OECC)* (2014), 750-752.

Patents

- Method and system for generating time-frequency representation of a continuous signal, J. Azana, **K. S. Reddy**, R. Maram, HG. De Chatellus, US Patent App. 16/583,736

Volunteering

- Reviewer for IEEE Journal of lightwave technology, Optics Express.
- Community engagement, optics outreach, optics education activities as part of OSA student chapters at IIT Madras and INRS.