Research Position Announcements from University of California, Davis

The Next Generation Networking Systems Laboratory at UC Davis invites applications for Ph.D. students, postdoctoral research scientists, and research project scientists specializing in the following areas.

1. **Scalable computing systems**: this position seeks key innovations in scalable high performance computing systems through a new generation of optical interconnects. The current project team is investigating new scalable computing systems, multi-core processor architectures, network-on-chip, nano-photonic/nano-electronic interconnect technologies, prototype system experiments, and hierarchical system architectures with optical-interconnects scaling to exascale. System throughput, workload analysis, and benchmarking studies are emphasized in the team project. The candidate is expected to conduct computing system integration, FPGA programming, experimental studies, architecture simulations, experimental emulations, and other relevant tasks for the team project.

2. **Silicon Photonics, III-V Photonics, Heterogeneous Integration, and Hybrid integration**: This position specializes in research and development of new photonic devices based on silicon, III-V, silica, and other materials leading to heterogeneous and hybrid integration in 2D and 3D towards functional microsystems on chip. The emphasis will be on integration of a large number of photonic and electronic components including lasers, modulators, detectors, multiplexers, demultiplexers, optical amplifiers, logic gates, arrayed waveguide gratings, transimpedance amplifiers, and electronic drivers. Multiple positions are available, and candidates are expected to work in a team environment taking part in one or more of design, fabrication, 2D/3D integration, testing, and application demonstrations. Applications of the integrated microsystems include computing, networking, imaging, and other areas, which will also involve testbed demonstrations. Demonstrated skills in one or more aspects of design, fabrication, and testing of photonic components are required.

3. **Heterogeneous Cognitive Wireless Networking** (as part of Unified Software-Defined Heterogeneous Wireless-Optical Networking Project): This position specializes in cognitive wireless networking and software-defined heterogeneous wireless-optical networking studies. The Unified Software-Defined Heterogeneous Wireless-Optical Networking project seeks true convergence of mobility and high-capacity networking with unprecedented throughput, agility, manageability, controllability, and interoperability.
The NGNS Laboratory at UC Davis has demonstrated software-defined elastic optical networking with cognitive adaptability across multi-domain networks, and now we are embarking on seamless integration of 5G wireless and elastic optical networks. We seek key innovations in network control and management, network architectures design, and multi-domain software defined networking for highly dynamic and adaptive cyberinfrastructures with true convergence of wireless and optical networking.

4. RF-Photonic technologies and systems: This position specializes in RF/microwave hybrid photonic-electronic integrated systems. The emphasis will be on RF-photonic communications, wireless-optical communications, signal processing, and metrology systems realized by integration of electronic and photonic components including lasers, modulators, microresonators, detectors, spectral multiplexers, optical amplifiers, logic gates, electronic amplifiers, phase-locked loops, and electronic drivers. In particular, this position specializes in RF, microwave, and analog circuits and their application to photonic integrated circuits. Excellent high-frequency analog design skills, a fine understanding of RF/microwave systems for photonic applications, demonstrated measurement skills, and good communication ability are desired. Familiarity with optical modulator design, microresonator-based optical frequency comb generation, or laser noise measurement is an asset.

Summaries of team projects are available on the web: [http://sierra.ece.ucdavis.edu](http://sierra.ece.ucdavis.edu). Interested candidates should send their resumes to sbyoo@ucdavis.edu. Interview in China is available during August 2-August 4 in Beijing.

Professor S. J. Ben Yoo
University of California, Davis, California 95616