

KEY COMPETENCIES

- Hot electron devices
- Monte Carlo simulation of charge carrier transport
- Semiconductor device physics
- Brain inspired computing hardware

EDUCATION

- Doctor of Philosophy**, Electrical Engineering Aug. 2018 - Present
University of Southern California
GPA: 3.96/4.00, (50 units completed)
- Master of Science**, Electrical Engineering Aug. 2018 - May 2020
University of Southern California
GPA: 3.96/4.00, 28 units
- Bachelor of Science**, Electrical and Electronic Engineering Apr. 2012 - Feb. 2017
Bangladesh University of Engineering and Technology (BUET), Bangladesh
CGPA: 3.83/4.00, 157.5 credits

TECHNICAL SKILLS

- Languages:** C, C++, MATLAB, Verilog HDL, Systemverilog, Assembly language, TCL, Bash, C-shell, PERL
- Material Growth and Characterization:** Sol-gel, hydrothermal, solid-state technique, PECVD, Photolithography, Spin-coating, ICP-RIE, XRD, XPS, EDX, SEM, FTIR spectroscopy, PL spectroscopy, Raman spectroscopy and UV-Vis spectrophotometry
- Device simulation tools** Archimedes Monte Carlo simulator, Sentaurus TCAD, Lumerical
- Instruments** Matisse Ti:Sa CW laser, Mai Tai HP Ti:Sa pulsed laser, Keysight Semiconductor Analyzer B1500a

PROFESSIONAL EXPERIENCE

- Design Engineer**, Neural Semiconductor Ltd Apr. 2017 - Feb. 2018
- Implemented different bus/interface architectures (APB, AHB, AXI, SPI, I2C, Wishbone, 10GE MAC) and performed verification with SystemVerilog using object oriented programming
 - Worked on synthesis and physical design of OpenRISC 1200 and RISC-V processors

CONFERENCE TALKS

- **R. Ahsan**, A. Mitra, S. Omar, M. Z. R. Khan, M. A. Basith, "Sol-gel synthesis of DyCrO₃ nanoparticles as novel photocatalysts," 2017 *National Conference on Physics*, Dhaka, Bangladesh, January 6, 2017
- **R. Ahsan**, M. Z. R. Khan, M. A. Basith, "Measuring the optical band gap of nanomaterials: Are we doing it in the right way?," 2018 *International Conference on Nanotechnology and Condensed Matter Physics*, BUET, Dhaka, Bangladesh, January 9, 2018.
- **R. Ahsan**, F. Rezaeifar, R. Kapadia, "Coupled Optical and Electronic Simulation of Integrated Photonics based Hot-Electron Graphene Photoemitters using a 2-D Ensemble Monte Carlo Boltzmann Transport Equation Solver and a Finite-Difference Time-Domain Maxwell's Equation Solver," 2019 *IEEE Pulsed Power and Plasma Science conference*, Orlando, Florida, USA, June 27, 2019.
- **R. Ahsan**, F. Rezaeifar, R. Kapadia, "Hot Electron Emission from Waveguide Integrated Graphene," 2019 *66th AVS Symposium*, Columbus, Ohio, USA, October 23, 2019.

POSTER PRESENTATION

- **R. Ahsan**, M. Z. R. Khan, M. A. Basith, "Modification of Beer-Lambert law and Kubelka-Munk function for nanomaterials," 2018 *International Conference on Nanotechnology and Condensed Matter Physics*, BUET, Dhaka, Bangladesh, January 9, 2018.
- **R. Ahsan**, A. Mitra, S. Omar, M. Z. R. Khan, M. A. Basith, "Sol-gel synthesized 10% Fe-doped DyCrO₃ nanomaterials for enhanced photocatalytic hydrogen production," 2018 *International Conference on Nanotechnology and Condensed Matter Physics*, BUET, Dhaka, Bangladesh, January 9, 2018.
- **R. Ahsan**, F. Rezaeifar, R. Kapadia, "Hot Electron Emission from Waveguide Integrated Graphene," 2019 *10th Annual Research Festival, Ming Hsieh Institute, USC*, Los Angeles, California, USA, November 8, 2019.
- **R. Ahsan**, R. Kapadia, "Integrated photonic components for photoemission", IVEC 2021.
- **R. Ahsan**, F. Rezaeifar, H. U. Chae, R. Kapadia, "High efficiency hot electron emission from waveguide integrated graphene", MRS 2021.
- **R. Ahsan**, M. A. Sakib, H. U. Chae, R. Kapadia, "Theoretical performance limits of graphene hot electron emission", MRS 2021.

RESEARCH ARTICLES

- **R. Ahsan**, M. Z. R. Khan, M. A. Basith, "Determination of optical band gap of powder form nanomaterials with improved accuracy," *Journal of Nanophotonics*, 11(4), 046016 (2017).
- **R. Ahsan**, A. Mitra, S. Omar, M. Z. R. Khan, M. A. Basith, "Sol-gel synthesis of DyCrO₃ and 10% Fe-doped DyCrO₃ nanoparticles with enhanced photocatalytic hydrogen production abilities," *RSC Advances*, 8(26), 14258-14267 (2018).

- M. A. Basith, **R. Ahsan**, Ishrat Zarin, M. A. Jalil, “Enhanced photocatalytic dye degradation and hydrogen production ability of Bi₂₅FeO₄₀-rGO nanocomposite and mechanism insight,” *Scientific reports*, 8(1), 11090 (2018).
- Fatemeh Rezaeifer*, **Ragib Ahsan***, Qingfeng Lin, Rehan Kapadia, “Hot electron emission processes in waveguide integrated graphene,” *Nature Photonics*, 1-6 (2019).
- Hyun Uk Chae*, **Ragib Ahsan***, Qingfeng Lin, Debarghya Sarkar, Rehan Kapadia, “High Quantum Efficiency Hot Electron Electrochemistry,” *Nano Letters*, 6227-6234 (2019).
- **Ragib Ahsan**, Mashnoon Alam Sakib, Hyun Uk Chae, Rehan Kapadia, “Performance limits of graphene hot electron emission photoemitters,” *Physical Review Applied*, 024060 (2020).
- Hyun Uk Chae*, **Ragib Ahsan***, Qingfeng Lin, Debarghya Sarkar, Rehan Kapadia, “Tunable Onset of Hydrogen Evolution in Graphene with Hot Electrons,” *Nano Letters*, (2020).
- Debarghya Sarkar, Jun Tao, **Ragib Ahsan**, Dingzhu Yang, Thomas Orvis, Sizhe Weng, Frank Greer, Jayakanth Ravichandran, Constantine Sideris, and Rehan Kapadia. “Monolithic High Mobility InAs-on-Oxide Grown at Low Temperature.” *ACS Applied Electronic Materials* (2020).
- Jun Tao, Debarghya Sarkar, Sizhe Weng, Thomas Orvis, **Ragib Ahsan**, Salil Kale, Yunpeng Xu et al. “High mobility large area single crystal IIIIV thin film templates directly grown on amorphous SiO₂ on silicon.” *Applied Physics Letters* 117, no. 4 (2020).
- Bo Wang, Sisi Yang, Yu Wang, **Ragib Ahsan**, Xiaowei He, Younghee Kim, Han Htoon et al. “Auger Suppression of Incandescence in Individual Suspended Carbon Nanotube pn-Junctions.” *ACS Applied Materials and Interfaces* 12, no. 10 (2020)
- Bo Wang, Sisi Yang, Yu Wang, Younghee Kim, **Ragib Ahsan**, Rehan Kapadia, Stephen K. Doorn, Han Htoon, and Stephen B. Cronin. “Broadband electroluminescence from reverse breakdown in individual suspended carbon nanotube pn-junctions.” *Nano Research* (2020).
- Hyun Uk Chae, **Ragib Ahsan**, Jun Tao, Rehan Kapadia, “Increasing the Hot-Electron Driven Hydrogen Evolution Reaction Rate on a Metal-Free Graphene Electrode”, *Advanced Materials interfaces*, 2001706 (2021).
- Fatemeh Rezaeifar, Hyun Uk Chae, **Ragib Ahsan**, Rehan Kapadia, “Hot electron emission from waveguide integrated lanthanum hexaboride nanoparticles”, *Applied Physics Letters*, 118, 071108 (2021).

* Equal contribution from authors