Santa Cruz, CA 95060
www.linkedin.com/in/ranaat

ANKIT RANA

(513) 886-8753
ankit.rana@ontera.bio

SUMMARY

Engineer with interdisciplinary research experience in Microfluidic/MEMS fabrication and Biosensors design (Nanopores). Leverages skill set in the life sciences industry and information technology (IT) at work. Adept, multi-lingual professional with proven ability as a team-player and a leader, having supervised students in graduate level courses.

PROFESSIONAL EXPERIENCE

R&D Engineer, Ontera, Inc. *(formerly Two Pore Guys, Inc.)*, Santa Cruz, CA   Mar 2018 - present

- Photolithography, plasma bonding in the clean-room fabrication of the dual nanopore chip.
- Assembly of the microfluidic dual nanopore device; design of Experiments (DOE) and data analysis via MATLAB around the two-pore control (Epigenetics application).
- Development of LabVIEW FPGA control for DNA linearization and bidirectional 'flossing' of detected single molecules.
- Assembly of the four-pore microfluidic strip (automated fluid delivery system), experimentation and device troubleshooting (network based) for the sample-to-answer point of care solution, 'SAM'.
- Conducting optical quality control (QC) of the fabricated nanopore chips, electrical failure detection of pores, microfluidic-strip fault analysis, agarose gel Electrophoresis and imaging.

Software Engineer, Aricent, Gurgaon (India)   Dec 2013 - Jul 2015

BluWAN EMS - Ethernet Switch Configuration Solution

- Formulated the front-end UI design with HTML, CSS, and AngularJS and back-end servlets in Java. Implemented SNMP for network management protocols.

Mantu - Server-less Secure Chat Application

- Engineered face authentication and peer-to-peer (server-less) secure messaging for Android platform in Java.
- Contributed modules for UI Interface, OTP generation, file storage and server-end communication for XMPP and HTTPS requests at the Ejabberd server.

Research Associate Intern, Evalueserve, Gurgaon (India)   Jun 2013 - Aug 2013

- Conducted patentability search, designed claim-charts, inspected patent litigation, and drafted new patents for a Fortune 100 consumer electronics manufacturer.

EDUCATION

Master of Science in Electrical Engineering, Specialization in Advanced Materials and Devices   Mar 2018
College of Engineering and Applied Science, University of Cincinnati, Cincinnati, OH   **GPA:** 3.96/4.00
Thesis: A study of electrokinetics in glass nanopores for biomolecular applications. **Adviser**: Dr. Leyla Esfandiari

Bachelor of Technology in Electronics and Communication Engineering   Jun 2013
Bharati Vidyapeeth's College of Engineering (GGSIPU), New Delhi, India   **CPI:** 80.19/100

Relevant Coursework: Biomedical Microsystems, Microfabrication of Semiconductor Devices, Microelectromechanical Systems, Biochip/Lab-on-a-Chip, Bio-microfluidics, Manufacturing Process, Circuits & Systems, Analog and Digital Electronics, VLSI Design.

Massive Online Open Courses (MooC) certifications: Circuits and Electronics – *edX (MIT)*, Embedded Systems – *edX (UT Austin)*, Fundamentals of Nano-electronics – *edX (Purdue University)* and Linux – *edX (Linux Foundation)*, Descriptive Statistics – *edX (UC Berkeley)*, Introduction to Computing technology inside your smartphone – *edX (Cornell University)*, OSHA Bloodborne Pathogens Online Training, OSHA Hazard Communication Standard Training.

SKILLS

Fabrication and metrology:	Mask design, Photolithography, Wet etching, Reactive Ion etching (RIE), Soft Lithography, Fluorescent and confocal microscopy, Plasma bonding, Spectroscopy (Ellipsometry), SEM, Laser assisted glass pore fabrication.
Molecular biology:	Nucleic Acid Invasion (Monostreptavidin-Tagged) and Hybridization, Agarose Gel Electrophoresis, Polymerase Chain Reaction (qPCR), Immunoassays, Dynamic light scattering (DLS), Microparticles conjugation (Surface chemistry).

Design tools:	MATLAB, COMSOL Multiphysics, CFD-GEOM & Ace+, SolidWorks, AutoCAD, ANSYS Fluent, LabVIEW, GNU Octave, Altium, OrCAD PSpice, Adobe Design Suite, MS Office.
Programming languages:	Java, C, C++, Erlang, JavaScript, Python, OpenCV, R, Angular JS, HTML, CSS, Oracle SQL Plus.

ACADEMIC EXPERIENCE

Graduate Research Assistant, Integrative Biosensing Laboratory, University of Cincinnati   Jan 2016 - May 2017

Design and optimization of a Nanopore-based biosensor for sequence-specific nucleic acid detection.

- Developed a 97% efficient binary biosensor for quantitative estimation of the impact of electro-osmotic force.
- Impact of varying buffer concentration and surface charges on the electrokinetics was studied with FEA based CFD.
- Successfully detected microRNA (miR-204 AND miR-210) related to clear cell renal cell carcinoma.

A Dielectrophoresis based Microfluidic device for Exosome isolation.

- Fabricated a particle isolator device in PDMS with a borosilicate pore as the collection zone using soft-lithography.
- Selective trapping of exosomes based on their sizes was achieved.

Microfabrication and characterization of a Piezo-resistive Pressure Sensor (MEMS).

- Microfabricated a pressure sensor based on Wheatstone bridge arrangement on a 6" Silicon-wafer using photolithography and wet-etching techniques.
- Efficiency, hysteresis analysis, and linearity of the device were studied.

Teaching Assistant, University of Cincinnati   Aug 2016 - May 2017

- Designed and taught the class, '*Biomicrofluidic Systems (laboratory) - EECE6078C*' encompassing COMSOL Multiphysics based FEA analysis and clean-room fabrication of active and passive microfluidic devices.
- Assisted students with review sessions in the class, '*Biomedical Microsystems - EECE6007*', graded assignments.

RECENT PUBLICATIONS AND PRESENTATIONS

- Liu, X., Zimny, P., Zhang, Y., Rana, A., Nagel, R., Reisner, W., & Dunbar, W. B. (2019). ***Flossing DNA in a Dual Nanopore Device***. Small, 1905379.
- Rana, A., Zhang, Y. and Esfandiari, L., 2018. ***Advancements in microfluidic technologies for isolation and early detection of circulating cancer-related biomarkers,*** Analyst.
- Shi, L., Rana, A. and Esfandiari, L., 2018. ***A low voltage nanopipette dielectrophoretic device for rapid entrapment of nanoparticles and exosomes extracted from plasma of healthy donors***, Scientific reports (Nature).
- Zhang, Y., Rana, A., Stratton, Y., Czyzyk-Krzeska, M.F. and Esfandiari, L., 2017. ***Sequence-Specific Detection of MicroRNAs Related to Clear Cell Renal Cell Carcinoma at fM Concentration by an Electroosmotically Driven Nanopore-Based Device***, Analytical chemistry, 89(17), pp.9201-9208.
- Poster: ***A dielectrophoretic nanopore device with spatiotemporal resolution for microvesicles entrapment and quantification near living cells***, The International Society for Extracellular Vesicles conf., May 2017, Toronto, ON.
- Poster: ***Impact of Electro-osmotic force in governing the motion of a charged species in a microfluidics based nanopore sensor***, presented at Center for Advanced Design and Manufacturing of Integrated Microfluidics (CADMIM) – Industrial Advisory Board meeting, September 7, 2016, University of Cincinnati, OH.
- Ghobadi, M., Zhang, Y., Rana, A., Esfahani, E.T. and Esfandiari, L., 2016, August. ***Quantitative estimation of electro-osmosis force on charged particles inside a borosilicate resistive-pulse sensor***, Engineering in Medicine and Biology Society (EMBC), 2016 IEEE 38th Annual International Conference of the (pp. 4228-4231). IEEE.

LEADERSHIP ROLES, COMMUNITY ACTIVITIES AND AWARDS

- **University Graduate Scholarship (UGS) recipient**, University of Cincinnati, Cincinnati, OH *(Aug 2015 – May 2017).*
- **Vice President (Communications)** of The Techno-mentorship Establishment at the University of Cincinnati, a platform helping students accomplish their entrepreneurial goals *(Mar 2015 - May 2017)*.