Exponent®
Engineering & Scientific Consulting

Nikita Taparia, Ph.D.

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Professional Profile

Dr. Nikita Taparia specializes at finding mechanical engineering solutions for biological-based and multi-physics problems. Specifically, she has spent nearly a decade focused on understanding platelet mechanobiology, axon regeneration, and other cellular behavior using microtechnology.

Dr. Taparia has expertise in microscopy (brightfield, fluorescence, metallurgical, SEM, Keyence), quantitative image analysis (FIJI/ImageJ/MATLAB), exploratory/statistical data analysis and data visualization (MATLAB, R, Tableau, IGOR, Excel). This experience has spanned across a diverse set of data (image analysis, clinical platelet function, magnetic sensors, satellite telemetry, soccer/tennis action). Dr. Taparia has worked with magnetic materials (nanoparticles/nanowires) and sensors (GMR, AMR, Hall effect). She is very comfortable with IRB protocols for human subject research as well as BSL-2 environments. Additionally, she is experienced with microfabrication techniques (photolithography, metal deposition, soft lithography) and rapid prototyping/3D printing (designs via SolidWorks and AutoCAD).

Prior to Exponent, Dr. Taparia earned her doctorate degree in mechanical engineering at University of Washington, where she developed two technologies: (1) a magnetic actuation microfluidic assay to assess platelet mechanoresponse during early hemostasis in vitro and (2) an optical system to assess anemia and bleeding risk within a microfluidic assay. The latter technology led to a startup venture, Stasys Medical, where Dr. Taparia was an R&D consultant. The company is currently developing a patient focused test method for analyzing blood clotting disorders and platelet dysfunction and has licensed Dr. Taparia's work. Additionally, she was nominated for the UW Excellence in Teaching Award in 2017 and is an avid participant in STEM outreach.

Before graduate school, Dr. Taparia earned an undergraduate degree in engineering physics at Cornell University. While there, she was Mission Operations and Fault Management lead for the Violet Satellite Project, an Air Force Research Lab sponsored mission to demonstrate CMG steering laws on a highly agile nanosatellite and use an ultraviolet spectrometer for scientific measurements. She followed up this experience with an internship at Space Systems/Loral where she built a universal data tool in MATLAB for all on-orbit satellites and she validated and verified contingency, health, and standard operating procedures for all subsystems of several satellites with a Python-based spacecraft simulator. She also assisted on a variety of research projects such as chip satellites and multiplexed microcolumn devices for RNA aptamer selection.

Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, University of Washington, 2020

MSME, Mechanical Engineering, University of Washington, 2018

B.S., Engineering Physics, Cornell University, 2012

Mamidala, Ramulu-Vinati Endowed Fellowship, 2016

Department of Education GAANN Fellowship, 2013-2016

NEMB 1st Place Poster Presentation, 2014

Academic Appointments

Research Scientist, UW, 2020-2021

Instructor, Mechanical Engineering, UW, Winter 2016

Graduate Student Researcher, UW, 2012-2020

Prior Experience

R&D Consultant, Stasys Medical, 2020-2021

On-Orbit Systems Engineering Intern, Space Systems/Loral, Summer 2012

Tech Specialist, National Institute of Aerospace, Spring 2012

Virtual World Developer, Cornell SciCentr, 2008-2009

Languages

Hindi

Publications

Taparia, N., Mollica, M.Y., Obenaus, A., Mach, Y.T., Sridhar, N., Sniadecki, N.J. Applied loads can modulate the stiffening of a hemostatic plug during formation through internal platelet forces. (In Preparation)

Hardin W.R., Alas G.C.M, Taparia N, Thomas E.B., Steele-Ogus M.C., Hvorecny K.L., et al. (2022) The Giardia ventrolateral flange is a lamellar membrane protrusion that supports attachment. PLoS Pathog 18(4): e1010496.

Falconieri, A. Taparia, N., De Vincentiis, S., Cappello, V., Sniadecki, N.J., Raffa, V. (2022) Magnetically-actuated microposts stimulate axonal regeneration. Biophysical Journal. 121(3): 374-382

Ting, L.H., Feghhi, S., Taparia, N., Smith, A.O., Karchin, A., Lim, E., St. John, A., Wang, X., Rue, T., White, N.J., Sniadecki, N.J. (2019) Contractile forces of platelet aggregates formed by microfluidic shear gradients can indicate platelet inhibition and bleeding risk. Nature Communication. 10, Article number: 1204.

Taparia, N., Platten, K., Anderson, K.B., Sniadecki, N.J. (2017) A Microfluidic Approach for Hemoglobin Detection in Whole Blood. AIP Advances. 7, 105102.

Beussman, K.M., Rodriguez, M.L., Leonard, A., Taparia, N., Thompson, C.R., Sniadecki, N.J. (2016) Micropost Arrays for Measuring Stem Cell-Derived Cardiomyocyte Contractility. Methods, 94:43-50. PMCID: PMC4761463

Presentations

Oral Presentation: Taparia, N., Realmuto, J. Lim, S., Canton, G., Borgford-Parnell, J.L., Cooperative Teaching as an Effective Training Mechanism for Future Instructors. ASEE Pacific Northwest Chapter. Seattle, WA. April 2017.

Poster: Taparia, N., Ting, L., Smith, A., and Sniadecki, N.J. Calcium Signaling and Force Generation in Platelets Under Rapid Blood Flow. NWBS. Seattle, WA. May 2015.

Oral Presentation: Taparia, N., Ting, L., Smith, A., and Sniadecki, N.J. Optical detection of clot contractility in a 'wound-in-a-chip' device. Photonics West. San Francisco, CA. Feb. 2015. (Paper #9320-21)

Poster: Taparia, N., Aaron, R.F., Tavakoli, S.N., Karchin, A., and Sniadecki, N.J. Polyurethane Negative Mold for Efficient Micropost Fabrication. MicroTAS. San Antonio, TX. Oct. 2014. (Paper#731)

Poster: Taparia, N., Ting, L., Smith, A. and Sniadecki, N.J. Bench Top Optical Detection of Clot Contractility for Diagnostics. MicroTAS. San Antonio, TX. Oct. 2014. (Paper# 721)

Poster: Taparia, N., Aaron, R.F., Tavakoli, S.N., Karchin, A., and Sniadecki, N.J. Reusable Polyurethane Negative Mold for Micropost Fabrication. BMES. San Antonio, TX. Oct. 2014. (Paper#1835)

Poster: Taparia, N., Ting, L., Smith, A. and Sniadecki, N.J. Optical Detection of Clot Contractile Forces. BMES. San Antonio, TX. Oct. 2014. (Paper#1809)

Poster: Taparia, N., Ting, L., Smith, A. and Sniadecki, N.J. CMOS-based Optical Sensor for Measurement of Platelet Contractile Force. NEMB. San Francisco, CA. Feb. 2014. (NEMB2014-93119) – Awarded 1st Place in Doctoral Poster Competition

Poster: Taparia, N., Bielawski, K., and Sniadecki, N.J. Electronic Detection of Magnetic Post Deflection. BMES Annual Meeting. Seattle, WA. Sept. 2013.

Poster: Taparia, N. and Sniadecki, N.J. Observation of Traction Forces During Galvanotaxis. Proceedings of the ASME 2013 Summer Bioengineering Conference. Sunriver, OR. June 2013. (SBC2013-14670)

Project Experience

Medical Device Litigation Support; Site investigations including fires, water damage, and construction defects; Laboratory analysis of polymers and metals; Construction project documentation analysis; HVAC system data analysis; Heat mapping of mold and water damage; Pattern analysis of qualitative data