Manish Shankla

Curriculum Vitae, July 2019

PERSONAL

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EDUCATION

PhD Computational Biophysics University of Illinois at Urbana-Champaign, **2014 – 2019**

BS Physics University of Illinois at Urbana-Champaign **2007 – 2012**
Minor: Computer Science

RESEARCH EXPERIENCE

University of Illinois, Urbana, Illinois, USA **2014 – 2019**
Graduate Student, Department of Physics (Advisor: Aleksei Aksimentiev)

- Performed large-scale molecular-dynamics simulations of DNA/protein transport on supercomputers.
- Developed stochastic simulation methods of lateral biomolecule capture from large-scale simulation data.
- Collaborate closely with experimentalists to determine physical mechanisms of desalination on novel-protein membrane and the designing of DNA sequencing devices.
- Contributed to the successful acquisition of computing time on various computing resources through proposal submissions.

University of Illinois, Urbana, Illinois, USA **2010**
Research Assistant, Department of Physics (Advisor: Laura Greene)

- Implemented a method to collect and calculate resistivity data on evaporated thin films and pnictide superconductors.

TECHNICAL SKILLS

- Expert in molecular dynamics package NAMD (5 years)
- Expert in visualization and analysis package VMD (4 years)
- Programming: Python, R, Bash, Tcl/Tk , C++/C (in course), Solidity (in course)
- Analogue and Digital Electronics (Course TA PHYS404 - Electronics)
- Coursework in Machine Learning (STAT 542), Computer Vision (CS 549), Smart Contracts and Blockchain Security (ECE 398)

JOURNAL ARTICLES

6. **Shankla M**, and Aleksei Aksimentiev. "Step-defect guided delivery of DNA to a graphene nanopore." Nature Nanotechnology (2019).
5. Megan Farell, Maxwell Wetherington, **Shankla M**, Inseok Chae, Shruti Subramanian, Seong H. Kim, Aleksei Aksimentiev, Joshua Robinson, and Manish Kumar. "Characterization of the Lipid Structure and Fluidity of Lipid Membranes on Epitaxial Graphene and Their Correlation to Graphene Features." Langmuir 35:4726-4735 (2019).
4. Ratul Chowdhury, Tingwei Ren, **Shankla M**, Karl Decker, Matthew Grisewood, Jeevan Prabhakar, Carol Baker, John H. Golbeck, Aleksei Aksimentiev, Manish Kumar, and Costas D. Maranas *PoreDesigner for tuning solute selectivity in a robust and highly permeable outer membrane pore.* Nat. Commun, 9:3661 doi:10.1038/s41467-018-06097-1 (2018).
3. **Shankla M** and Aleksei Aksimentiev *Modulation of Molecular Flux Using a Graphene Nanopore Capacitor.* J. Phys. Chem. B, 25: 936–946. doi 10.1021/acs.jpcb.6b10574 (2016).

2. Shouvik Banerjee, James Wilson, Jiwook Shim, **Shankla M**, Elise Corbin, Aleksei Aksimentiev, Rashid Bashir *Slowing DNA Transport using Graphene-DNA Interactions* . Adv. Funct. Mater., 25: 936–946. doi: 10.1002/adfm.201403719 (2015).

1. **Shankla M** and Aksimentiev A. *Conformational transitions and stop-and-go nanopore transport of single-stranded DNA on charged graphene* Nat. Commun. 5:5171 doi: 10.1038/ncomms6171 (2014).

Talks and Poster Presentations

- "DNA delivery on the edge of graphene". Center for the Physics of Living Cells/Biophysics Graduate Student and Postdoc Symposium (Talk) **Awarded Best Talk**
- "DNA transport to and through 2D materials". Bremen Nanopore Workshop Bremen, Germany July 2018 (Talk)
- Organizer of the Fall 2017 Center for the Physics of Living Cells/Biophysics Graduate Student and Postdoc Symposium
- "Defect-Guided Transport of Biomacromolecules". Biophysical Society 61th Annual Meeting. New Orleans, Louisiana February 2017 (Poster)
- "Conformational Transitions and Stop-and-Go Nanopore Transport of Single-Stranded DNA on Charged Graphene". Conference of the International Physics of Living Systems iPoLS Arlington, Virgina. July 17 2015 (Talk)
- "Conformational Transitions and Stop-and-Go Nanopore Transport of Single-Stranded DNA on Charged Graphene". University of Illinois at Urbana Champaign Center for the Physics of Living Cells/Biophysics Graduate Student/Postdoc Symposium. Champaign, Illinois. November 2014 (Talk)
- "DNA and Ion transport through Graphene Nanostructures". Biophysical Society 57th Annual Meeting. Philadelphia, Pennsylvania February 2013 (Poster)
- "Uncovering the microscopic mechanism of strand exchange during RecA mediated homologous recombination using all-atom molecular dynamics simulations" American Physical Society (APS) March Meeting, Boston, Mass March 2012. (Talk)

Teaching Experience/ Outreach

- PHYS401 - Classical Physics lab, PHYS404 - Electronic Circuits, PHYS212 - Electricity and Magnetism, MCB 151 - Biology Lab
- Instructed modules for CPLC Summer School 2017/2018/2019
- Various IGB/CPLC public outreach events
- Center for Physics of Living Cells Leal Elementry School Science Lessons. 2014 - Present
- NIH Sponsored "Hands-on" Workshop on Computational Biophysics. November 2013
- Illini Summer Academy Physics. June 2012.

References

References are available upon request