

Nilushi L. Dasanayake

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PROFESSIONAL PROFILE PhD in physics specialized in biophysics of cell mechanics. Investigated the effects of the network structure on intra cellular force generation via simulation of myosin mini-filament motion through a random actin network and demonstrated the generality of actomyosin contractility for the first time.

EDUCATION **Ph.D. in Physics, Washington University in St. Louis**, 2013. (GPA : 3.81/4.00)
• Thesis Title: Actomyosin Contractility in Non-muscle Cells.
• Advisor: Prof. Anders E. Carlsson.
M.A. in Physics, Washington University in St. Louis, 2009.
B.Sc., Major in Physics with First Class Honors (equivalent to *summa cum laude*), **University of Peradeniya, Sri Lanka. 2006.** (GPA: 3.88/4.00)

PUBLICATIONS & CONFERENCE PRESENTATIONS **Nilushi L. Dasanayake** and Anders E. Carlsson, “**Stress Generation by Myosin Mini-filaments in Actin Bundles**”, Physical Biology, Vol. 10, pp. 036006, 2013. ([Link](#))

Nilushi L. Dasanayake, Paul Michalski and Anders E. Carlsson, “**General Mechanism of Actomyosin Contraction**”, Physical Review Letters, Vol. 107, pp. 118101, 2011. ([Link](#))

Nilushi L. Dasanayake, Oral presentation “**Generality of observed contractility in isotropic actomyosin networks**”, Cytoskeleton Group Meeting, School of Medicine, Washington University in St. Louis, St. Louis, Missouri, Sep. 2011.

Nilushi L. Dasanayake, Anders E. Carlsson, Poster presentation “**Stress generation by acto-myosin networks**”, Graduate Research Symposium, Washington University in St. Louis, St. Louis, Missouri, Feb. 2011.

Anders E. Carlsson, Leah Keshet, Jay Tang, **Nilushi L. Dasanayake**, Paul Michalski, Mark Burnett, Poster presentation “**Control of Actin Assembly and Cell Migration by Actin-Regulating Proteins**”, Frontiers in Mathematical Biology NSF-NIH PIs Meeting at University of Maryland, College Park, Maryland, April 2010.

Nilushi L. Dasanayake, Anders E. Carlsson, Poster presentation “**Stress generation by myosin minifilaments in isotropic actin networks**”, 54th Annual Biophysical Society Meeting, San Francisco, Feb. 2010.

EXPERIENCE **University of Peradeniya**, Peradeniya, Sri Lanka.

Senior Lecturer in the Department of Physics

Since May, 2021

University of Portland, Portland, OR, USA.

Adjunct Faculty at University of Portland - Teaching

- Calculus Based General Physics **Spring 2019**
Taught calculus-based physics covering the basic principles of mechanics. Was responsible for preparing lectures, quizzes, examinations and grading. Held and facilitated review sessions and office hours.
- General Physics Laboratory I , II **Spring 2019, Fall 2018**
Supervised and assisted freshman and sophomore-level undergraduates in general physics laboratory.

- Algebra Based College Physics **Spring 2017**
Taught basic principles of fluids, waves, sounds, optics, electricity and magnetism. Was responsible for preparing lectures, quizzes, examinations and grading. Held and facilitated review sessions and office hours.

University of California Santa Barbara, Santa Barbara, CA, USA.

Visiting scholar with Prof. Otger Campàs - Research

December 2013 to July 2014

- Motor Coordination.
Investigated on the coordinated motion in molecular motors walking along polymer tracks. Used Lattice Kinetic Montecarlo algorithm (Gillespie algorithm) to simulate the coupled dynamics of motors.

Washington University in St. Louis, St. Louis, MO, USA.

Graduate Research Assistant with Prof. Anders E. Carlsson

August 2007 to May 2013

Research

- Stress generation by myosin mini-filaments in actin bundles.
Studied the mechanism behind contractility due to myosin mini-filaments in actin bundles. Despite the equal probability for contraction and expansion due to the minifilament movement towards the barbed ends of actin filaments, we observed that the generated stresses are overwhelmingly contractile. Parallel geometry of actin filaments in bundles was found to enhance the stress propagation to the walls.
- Generality of actomyosin contractility.
Investigated the contractility due to myosin mini-filaments in a random actin network. Found that the mechanism behind contraction is quite general. Showed that the contractile state for mini-filaments is energetically more favorable over the expansive state and it rotates to reach the contractile configuration. Actin filament bending was found to help accommodate this rotation.

Teaching

August 2008 to 2011

- Teaching Assistant for Physics 197/117 : General Physics Laboratory in Fall 2011.
Conducted half an hour lecture and supervised 2 hour laboratory for freshman level undergraduate students.
- Teaching Assistant for Physics 118: General Physics Laboratory in spring 2009.
Conducted half an hour lecture and supervised 2 hour laboratory for freshman level undergraduate students.
- Teaching Assistant for Physics 217: Introduction to Quantum Physics in Fall 2008.
Performed grading and held help sessions for sophomore undergraduate students.

University of Peradeniya, Peradeniya, Sri Lanka.

Undergraduate Student

February 2002 to May 2006

Research

- Tested the ability to use NaOOH as the cathode with Cu as the anode for rechargeable batteries.
NaOOH was synthesized and pressed to form a pellet and used as the cathode. Rechargeability was observed with a constant power for few seconds. An industry level battery tester was used to measure voltage, power and capacity.

Teaching

June 2006 to June 2007

- Teaching Assistant for General Physics Laboratory for Sophomores: Conducted a half hour lecture and supervised 3 hour laboratory.

TECHNICAL SKILLS

Mathematical packages: [MATLAB](#), Mathematica.

Programming: C, OpenGL, C++, Java, Visual Basic, C-shell scripting, SQL.

Computer Applications: \TeX (\LaTeX , \BibTeX), Vim.

Operating Systems: Microsoft Windows family, Apple OS X, UNIX.

Presentation tools: MS Office.

AWARDS

- **University Fellow**, Washington University in St. Louis, Fall 2007 & Spring 2008.
- **University Awards for Academic Excellence**, University of Peradeniya, 2006.