
PATTIPONG WISANPITAYAKORN

CURRENT ADDRESS

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PERMANENT ADDRESS

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EDUCATION

Ph.D. in Physics, Worcester Polytechnic Institute (WPI), Worcester, MA, USA

August 2019 (GPA: 3.93/4.00)

Dissertation: "Mechanical Properties of Bio-polymers Probed via Curvature"

Advisor: Dr. Erkan Tüzel

B. S. in Physics, Worcester Polytechnic Institute, Worcester, MA, USA

May 2013, Graduated with High Distinction (GPA: 4.00/4.00)

Major Qualifying Project: "Analysis of Actin Filament Bending in Gliding Assays"

Awards: Robert H. Goddard Award, Sigma Xi MQP Award, SURF Award

Advisor: Dr. Erkan Tüzel

SKILLS

EXPERIMENTAL SKILLS:

- Microscopy
 - Experience with building and using a total internal reflection fluorescence microscope (TIRFM)
 - Automated Inverted fluorescence and bright-field microscope
 - Atomic force microscopy (AFM)
- Biochemistry Techniques:
 - Affinity chromatography for protein purifications
 - ✦ Gravity column
 - ✦ Fast protein liquid chromatography (FPLC)
 - Bacterial cultures and protein expressions
 - Bacterial transformations
 - SDS-PAGE and western blotting
 - PCR, plasmid purification, and cloning
 - Spectrophotometer, NanoDrop, Bradford assays
- Molecular Biology Techniques:
 - Motility assays
 - Single molecule assays

COMPUTER LITERACY:

- *Programming:*
 - FORTRAN 77/90/95 (Advanced)

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- C (Intermediate)
 - Python (Intermediate)
 - UNIX shell scripting (including sed and awk) (Intermediate)
 - Java (Beginner)
 - *Scientific Packages*:
 - Matlab (Advanced)
 - R (Beginner)
 - Mathematica (Intermediate)
 - Maple (Intermediate)
 - COMSOL (Beginner)
 - *Operating System*: All variants of Microsoft Windows, Mac OS X, Linux
 - *Imaging/Visualization*: ImageJ, Blender, OpenDX, Grace, Origin
 - *Typesetting*: LaTeX, Microsoft Office, Keynote/Pages and other common productivity packages for Windows, Mac OS X, and Linux
 - 3D printing softwares

PROFESSIONAL EXPERIENCE

Postdoctoral Researcher, Department of Biomedical Engineering, Temple University, Philadelphia, PA, USA, September 2019 – July 2020

- Setting up a molecular biology lab
- Building a total internal reflection fluorescence microscope (TIRFM)
- Performing and developing protocols for bacterial transformations, bacterial cultures, protein expressions, protein purifications, plasmid purifications, measuring plasmid/bacteria/protein concentrations, and performing single-molecule and motility assays experiments
- Studying molecular motor properties using single-molecule experiments and motility assays
- Analyzing collagen fibers during cancer invasion
- Analyzing curvatures and cell sizes of mutant moss tips to understand their growth mechanisms

Research Assistant, Department of Physics, Worcester Polytechnic Institute, Worcester, MA, USA, August 2010 – August 2019

- Measuring mechanical properties of bio-filaments
- Modeling of cooperative cargo transport via molecular motors
- Investigating the effect of chemotherapy drugs on mammalian microtubules

Interim Lab Coordinator, Department of Physics, Worcester Polytechnic Institute, Worcester, MA, USA, August 2017 – April 2018

- Overseeing all freshmen laboratories
- Mentoring teaching assistants and peer learning assistants

Teaching Assistant, Department of Physics, Worcester Polytechnic Institute,

Worcester, MA, USA, March – May 2011, *August 2013 – May 2014 and August 2015 – May 2017*

Peer Learning Assistant, Department of Mathematical Sciences, Worcester Polytechnic Institute, Worcester, MA, USA, August – December 2010

TEACHING AND MENTORING EXPERIENCE

COURSES TAUGHT

WORCESTER POLYTECHNIC INSTITUTE

Department of Physics 2011, 2013 – 2014 and 2015 – 2017

- General Physics-Mechanics, Laboratory Instructor (PH 1110)
- Principles of Physics-Mechanics, Laboratory Instructor (PH 1111)
- General Physics-Electricity and Magnetism, Laboratory Instructor (PH 1120)
- Principles of Physics-Electricity and Magnetism, Laboratory Instructor (PH 1121)
- Modern Physics, Laboratory Instructor (PH 1130)
- Oscillations and Waves, Laboratory Instructor (PH 1140)
- Atomic Force Microscopy, Laboratory Instructor (PH 2510)

Department of Mathematical Sciences 2010

- Multivariable Calculus, Conference Instructor (MA 1024)

INVITED INSTRUCTOR

- Extracurricular class on Academic Poster and Oral Presentations for students under the Development and Promotion of Science and Technology Talents Project (DPST), Kaennakhon Witthayalai School, Thailand, June – July, 2014

INVITED SPEAKER

- Enrichment Science Classroom of Upper North-Eastern Network orientation, Charoen Thani Hotel, Khon Kaen, Thailand, June 13, 2016
- Enrichment Science Classroom of Upper North-Eastern Network orientation, Charoen Thani Hotel, Khon Kaen, Thailand, June 15, 2015
- DPST students orientation, Kaennakhon Witthayalai school, Thailand, May 15, 2014
- Kaennakhon Witthayalai school grade 10 student orientation, Kaennakhon Witthayalai school, Thailand, May 8, 2013

MENTORING

- Jack Oswald, M.S. student, Department of Bioengineering, June 2020 – July 2020
- The Goddard Cup Water Rocket Competition, Worcester Polytechnic Institute, June 8, 2016
- Wiphu Youyen, Ph.D. student, Department of Physics, WPI, August 2015 – May 2018

- The Goddard Cup Water Rocket Competition, Worcester Polytechnic Institute, June 10, 2015
- Karnjana Atthawilai, a high school DPST student, on her DPST thesis presentation on "Synthesis and FTIR Characterization of Polyol from Glycolysis of PET Bottles", Kaennakhon Witthayalai School, April, 2015

HONORS AND AWARDS

- Received, through a university-wide competition, a \$900 registration fee waiver for the Motile & Contractile Systems Gordon Research Conference, WPI, 2017
- Received, through a university-wide competition, WPI Graduate Student Travel Fund of \$1,000.00 to support travel to the Biophysical Society 61st Annual Meeting, WPI, 2017
- Earned the Outstanding Teaching Assistant Award in recognition of excellence on teaching and other instructional activities, Physics Department, WPI, 2016
- Promoted to an Associate Member of Sigma Xi, 2014
- Earned the Sigma Xi award in recognition of outstanding major qualifying project (Analysis of Actin Filament Bending in Gliding Assays), WPI, 2014
- Earned the Robert H. Goddard award in recognition of outstanding achievement, scholarship, consistent effort and dedication of purpose in both theoretical and experimental areas in physics (highest award for a graduating physics major), Physics Department, WPI, 2013
- Received WPI Summer Undergraduate Research Fellowship (SURF), WPI, 2012
- Recognized as a Charles O. Thomson Scholar for academic excellence in the first year at WPI, 2010
- Earned the Royal Thai Government scholarship to study Physics in the US, 2008
- Selected (10 out of 60 nationwide DPST scholars) to participate in the Sunburst Youth Camp, Singapore, December 9 – 15, 2007
- Honorable mention at the 6th POSN Physics Olympiad, 2006

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- American Physical Society
- Biophysical Society
- Sigma Xi

MANUSCRIPTS

1. Sonar, P., Youyen, W., Cleetus, A., Wisanpitayakorn, P., Mousavi, I. S., Stepp, W. L., Hancock, W. O., Tüzel, E., Ökten, Z. (2020) *Kinesin-2 from C. reinhardtii is an atypically fast and auto-inhibited motor that is 1 activated by heterotrimerization for intraflagellar transport*. Current Biology 30(6) 1160-1166.e5. [Q1, IF 9.601]
2. Wisanpitayakorn, P., Mickolajczyk, K., Hancock, W. O., Vidali, L., Tüzel, E., Measurement of the persistence length of cytoskeletal filaments using curvature distributions. Biophysical Journal (in revision) [Q1, IF 3.854]

3. Galotto, G., Wisanpitayakorn, P., Bibeau, J., Liu, Y. C., Simpson, P., Tüzel, E., Vidali, L., (submitted) Myosin XI drives polarized growth by vesicles clustering and local enrichment of F-actin in *Physcomitrella patens*. *Plant Cell* (in review) [Q1, IF 9.618]

INVITED COLLOQUIA

1. "Understanding Biological Structures through Curvatures ", Biochemistry Department Seminar, Siriraj Hospital, Bangkok, Thailand, February 12, 2019
2. "Measurement of the persistence length of cytoskeletal filaments using curvature distributions", Bioinformatics and Computational Biology Seminar, Worcester Polytechnic Institute, Worcester, MA, March 16, 2017
3. "Measurement of the persistence length of cytoskeletal filaments using curvature distributions", Physics Graduate Student Seminar, Worcester Polytechnic Institute, Worcester, MA, November 17, 2016
4. "Analysis of cytoskeletal filament bending in a gliding assay experiment", Physics Graduate Student Seminar, Worcester Polytechnic Institute, Worcester, MA, December 2, 2015
5. "Analysis of actin filament bending using curvature distributions", Research Presentation Day, Department of Physics, Worcester Polytechnic Institute, Worcester, MA, April 13, 2013

TALKS AT OTHER MEETINGS AND SEMINARS

1. "Biosensors from Molecular Motors and Cytoskeleton", Annual ATPAC-MOST-OHEC-IPST Conference, Clearwater, FL, January 26 – 28, 2018
2. "Measurement of the persistence length of cytoskeletal filaments using curvature distributions", Spring Meeting of the APS New England Section in conjunction with NanoWorcester, Worcester Polytechnic Institute, Worcester, MA, April 14 – 15, 2017 (Local)
3. "Analysis of actin filament bending using curvature distributions", 60th New England Complex Fluids Workshop, Brandies University, Waltham, MA, September 19, 2014 (Local)

POSTER PRESENTATIONS

1. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", [Pattipong Wisanpitayakorn](#), Keith J. Mickolajczyk, William O. Hancock, Dan L. Sackett, Luis Vidali and Erkan Tüzel, The Central New York (CNY) Cytoskeleton meeting, Syracuse, NY, April 5, 2019
2. "Investigating Myosin XI Function in *Physcomitrella Patens* Tip Growth by Conditional Mutagenesis", [Giulia Galotto](#), Jeffrey Bibeau, Yen-Chun Liu, [Pattipong Wisanpitayakorn](#), Erkan Tüzel and Luis Vidali, The American Society for Cell Biology and the European Molecular Biology Organization Meeting, San Diego, CA, December 8 – 12, 2018 (International)
3. "Simulation of Microtubule Gliding Assay on Lipid Bilayer", [Pattipong Wisanpitayakorn](#), Keith J. Mickolajczyk, William O. Hancock, Dan L. Sackett, Luis

Vidali and Erkan Tüzel, Cytoskeletal Motors Gordon Research Conference, Mt. Snow, West Dover, VT, July 8 – 13, 2018 (International)

4. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Dan L. Sackett, Luis Vidali and Erkan Tüzel, The Graduate Research Innovation Exchange, Worcester Polytechnic Institute, Worcester, MA, April 24, 2018 (Local)
5. "Probing Mechanical Deformations of Cytoskeletal Filaments via Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Dan L. Sackett, Luis Vidali and Erkan Tüzel, The Biophysical Society 62st Annual Meeting, San Francisco, CA, February 17 – 21, 2018 (International)
6. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, The American Society for Cell Biology and the European Molecular Biology Organization Meeting, Philadelphia, PA, USA, December 2 – 6, 2017 (International)
7. "Curvature Distribution of Gliding Cytoskeletal Filaments", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, Motile and Contractile Systems Gordon Research Conference, Colby-Sawyer College, New London, NH, July 30 – August 4, 2017 (International)
8. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, The Biophysical Society 61st Annual Meeting, New Orleans, LA, February 10 – 15, 2017 (International)
9. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, The Graduate Research Innovation Exchange, Worcester Polytechnic Institute, Worcester, MA, February 8, 2017 (Local)
10. "Measurement of Mechanical Properties of Cytoskeletal Filaments", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, 4th Biophysical Society Pennsylvania Network Meeting, Poster, Bethlehem, PA, October 14, 2016 (Local)
11. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, The Graduate Research Poster Finals, The Graduate Research Innovation Exchange, Worcester Polytechnic Institute, Worcester, MA, April 11, 2016 (Local)
12. "Measurement of the Persistence Length of Cytoskeletal Filaments using Curvature Distributions", Pattipong Wisanpitayakorn, Keith J. Mickolajczyk, William O. Hancock, Luis Vidali and Erkan Tüzel, The Graduate Research Innovation Exchange, Worcester Polytechnic Institute, Worcester, MA, April 11, 2016 (Local)
13. "Novel approaches to characterize deformation of cytoskeletal filaments", Pattipong Wisanpitayakorn, Luis Vidali and Erkan Tüzel, New England Muscle and Motors Workshop, UMASS Amherst, MA, 2015 (Local)
14. "Analysis of Actin Filament Bending using Curvature Distributions", Pattipong Wisanpitayakorn, Luis Vidali and Erkan Tüzel, The Graduate Research Innovation

*Underlined authors indicate presenters of the posters

Exchange, Worcester Polytechnic Institute, Worcester, MA, December 10, 2014 (Local)

15. "Analysis of actin filament bending using curvature distributions", [Pattipong Wisanpitayakorn](#), Luis Vidali and Erkan Tüzel, The Graduate Research Achievement Day, Worcester Polytechnic Institute, Worcester, MA, March 19, 2014 (Local)

OTHER WORKSHOPS AND MEETINGS

1. Yale Microscopy Workshop, The Anlyan Center for Medical Research & Education, New Haven, CT, June 14 – 15, 2016 (Local)
2. QCBNet Workshop: Modeling in Cell Biology - Scale and Granularity, San Francisco Airport Hyatt Regency, San Francisco, CA, May 18 – 19, 2015 (National)
3. QCBNet Workshop: Numerical Methods in Cell Biology, UCSF Fisher Conference Center, San Francisco, CA, March 26, 2015 (National)

EXTRA-CURRICULAR ACTIVITIES

- 2015-2016 Yonex Northeast Collegiate Team Badminton Championships Playoff, Division 1B, 2nd place, New Jersey Badminton Club, Montville, NJ, USA, April 9 – 10, 2016
- Member of the WPI Badminton Club, Worcester Polytechnic Institute, Worcester, MA, USA, 2011 – 2019
- Member of the Society of Physics Students, Worcester Polytechnic Institute, Worcester, MA, USA, 2009 – 2019
- Vice President of the WPI Badminton Club, Worcester Polytechnic Institute, Worcester, MA, USA, 2012 – 2013

REFERENCES

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3. Dr. Luis Vidali
Associate Professor of Biology and Biotechnology

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4. Helen Freitas

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