

# Siyuan Thaddeus Wu

Early Career Researcher  
and Lecturer

## Contact

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### Google Scholar

<https://scholar.google.com/citations?user=8svA7HYAAAAJ&hl=en>

### ResearchGate

<https://www.researchgate.net/profile/Siyuan-Wu-30>

### ORCID

<https://orcid.org/0000-0003-2871-5473>

### University Personal Page

<https://research.jcu.edu.au/portfolio/thaddeus.wu/>

## Research Skills

MATLAB, R Language, Python

Julia Programming, Latex,

Adobe illustrator

Dr Wu is a highly motivated early career postdoctoral researcher and lecturer in the Department of Molecular and Cell Biology at James Cook University, Australia. He earned his PhD in Applied Mathematics, specialising in Mathematical and Computational Systems Biology, from Monash University, Australia, in March 2022.

His research interests lie in the field of mathematical and systems biology, where he demonstrates experience with deterministic/stochastic mathematical modelling, algorithm development, and statistical analysis to study the mechanisms of cell-fate determination. His research has been published in peer-reviewed journals and presented at international conferences. Dr Wu is passionate about advancing our understanding of biological systems through the application of mathematical and computational techniques. His current research focuses on developing a novel mathematical framework to describe how alternative splicing mechanisms and isoform expression at the single-cell level regulate cell-fate determination.

## Work History

2022-07 -  
Current

### Early Career Researcher/Lecturer (Level B)

*Department of Molecular & Cell Biology,  
College of Public Health, Medical and Vet Sciences,  
James Cook University, Townsville, QLD*

- Contributed to and actively participated in research conception, design, and execution to address defined problems.
- Contributed to and actively participated in grant proposal conception, design, and writing.
- Developed mathematical models and algorithms for the defined problems.
- Wrote and published peer-reviewed articles concerning findings and highlighted possible applications for findings.
- Provided academic guidance and practical support for higher degree research candidates.
- Evaluated and revised lesson plans and course content to achieve student-centered learning.
- Used variety of learning modalities and support materials to facilitate learning process and accentuate presentations.
- Played a key role in designing and developing a new Bioinformatics major within existing bachelor programs.
- Designed and developed a new Computational Systems Biology subject for the Bioinformatics major.

2021-09 - **Research Assistant**  
2022-01 *Faculty Of Business and Economics,*  
*Monash University Clayton Campus, VIC*

- Worked with principal investigators to coordinate quantitative research into actuarial studies.
- Generated data models performed statistical analysis and helped produce reports outlining results.
- Gathered, arranged, and corrected research data to create representative graphs and charts highlighting results for journal publication.
- Demonstrated strong writing skills to generate original reports.

2017-03 - **Teaching Assistant**  
2021-12 *School Of Mathematics, Monash University Clayton Campus, VIC*

- Prepared lessons according to course outline to convey required material and deepen student understanding of subject matter.
- Checked assignments, proctored tests, and provided grades according to university standards.
- Documented attendance and completed assignments to maintain full class and student records.
- Maintained atmosphere of academic learning and advancement to facilitate learning and development of critical thinking skills.

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## Education

2018-01 - **Doctor of Philosophy: Applied Mathematics -**  
2022-03 **Mathematical and Computational Biology**  
*Monash University - School of Mathematics*

- Thesis Topic: Mathematical modelling and inference of genetic regulation for cell fate determination in hematopoiesis
- Received Dean's International Postgraduate Research Scholarship
- Postgraduate Representative of School of Mathematics

2017-02 - **Bachelor of Science (Honours): Probability and Statistics**  
2017-12 *Monash University - School of Mathematics*

- Received Alan Pryde Study Grant
- Thesis Topic: Introduction to Large Deviations Principle

2014-02 - **Bachelor of Commerce: Financial and Insurance**  
2016-12 **Mathematics**  
*Monash University - Faculty of Business and Economics*

## Publications

- Wu S., and Schmitz U. 2023. Single-cell and long-read sequencing to enhance modelling of splicing and cell-fate determination, *Computational and Structural Biotechnology Journal* **21**, 2373-2380
- Wu S., Zhou T, Tian T. A robust method for designing multistable systems by embedding bistable subsystems. *npj Systems Biology and Applications* **8**, 10 (2022).
- Wu S., Cui T, Zhang X, Tian T. A non-linear reverse-engineering method for inferring genetic regulatory networks. *PeerJ* **8**, e9065 (2020)
- Wu S., Cui T. and Tian T. 2018. Mathematical Modelling of Genetic Network for Regulating the Fate Determination of Hematopoietic Stem Cells, *Proceedings of 2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2018)*, 2167-2173, IEEE Press.

## Ongoing Projects

- Wu S., Parsania C., Bailey C., and Schmitz U., multilevel modelling of AGO-mediated alternative splicing.
- Wu S. and Schmitz U, Transcriptome complexity as a new RNA-based feature in studying endothelial-to-hematopoietic transition.
- Wu S. and Schmitz U, Multilevel Modelling of Transcriptome Complexity in Cell-Fate Determination

## Activities

- Guest lecture at the 2023 CTBMB Nanopore Workshop, James Cook University, Townsville, Australia
- Invited talk at the 2022 Annual Conference of the Centre for Tropical Bioinformatics and Molecular Biology, Mission Beach, Australia
- Attended at the 2019 CSIAM 1st Annual Conference on Mathematical Life Science, Guangzhou China
- Presented at the 2018 IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2018), Madrid Spain

## Professional Roles

- Program Committee Member and Reviewer of the IEEE International Conference on Bioinformatics and Biomedicine
- Review Editor of *Frontiers in Systems Biology*

## Memberships

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- Member of Centre for Tropical Bioinformatics and Molecular Biology (CTBMB)
- Affiliate member of the School of Mathematics, Monash University