JÉRÔME WONG NG

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SKILLS

Microscopy Wide field, Confocal, 2-photon microscopy. (Commercial and custom made)
Microfluidics Soft lithography, micromilling techniques. 3D Printing
Programming Matlab, Python, LabVIEW, ImageJ, C, C++, some exposure to Java
Machine Learning : regression techniques, reinforcement learning, Neural networks

EDUCATION

Ph.D Biophysics *2004-2008*
University P. et M. Curie, Paris 6 and Ecole Normale Suprieure, Paris, France
Masters soft condensed matter *2002-2004*
University P. et M. Curie, Paris 6 and Ecole Normale Suprieure, Paris, France
Bachelor Fundamental physics *1999-2002*
University P. et M. Curie, Paris 6 and Ecole Normale Suprieure, Paris, France

RESEARCH PROJECTS/POSITIONS

Noise in cell fate specification — Post-doc, Pasteur Institute *Aug. 2018 -*
◦ High speed quantification of transcriptional activity using advanced confocal microscopy
◦ Implementation and adaptation of existing techniques to a new model system, the development in the eye disc.
◦ Reproducibility and precision of spontaneous symmetry breaking of synthetic embryos.
AI applied to biotechnology — Data scientist, Pasteur Institute *Sep. 2017 - July 2018*
◦ Machine learning techniques to decipher Cas9 efficiency variability in CRISPR screens
◦ Implemented Neural Networks to actual screen.
◦ Deep Learning techniques for de novo protein design
Soaring in fluctuating environment — Project scientist, UCSD *Mar. 2016 - Aug. 2017*
◦ Modified an open source codebase (Arduplane) to implement home made autonomous flight control in rc-glider
◦ Implemented reinforcement learning algorithm (SARSA) in rc-glider.
◦ Gathered and analyzed experimental flight data to assess the performance of the developed strategy.
◦ Design and testing of mechanical pieces to be 3d printed for plane assembly.
Bacterial chemotaxis — Post-doc, Pasteur Institute and Project scientist, UCSD *2009-2017*
◦ Microscopy imaging of bacteria in microfluidically engineered nutrient profiles.
◦ Contributed to image analysis script to extract bacterial trajectories from video microscopy. Developped GUI based ImageJ plugin to enable rapid vizualisation and trajectory manual correction.
◦ Contributed to non-invasive inference method to characterize bacterial chemotaxis in single cells
◦ Published 4 articles, major idea overturns belief that bacterial chemotaxis is optimal when perfectly adapted, 1 paper in review overturning foraging role of chemotaxis.
Plasmid copy number — Graduate student, UPMC/ENS Paris *Oct. 2004 - Dec 2008*
◦ Designed, conducted, and analyzed bacterial fluorescence measurement using custom-built high throughput microfluidic setup and highly sensitive optics
◦ Published 2 papers establishing only method up-to-date to extract variance in plasmid copy number in a population of bacteria

TEACHINGS/MENTORING/COMMUNICATION

◦ Instructed physics course for medical students (Fluid dynamics, Diffusion processes, Electricity) for 3 years $\sim$ 40 students per year, 2004-2007
◦ Mentored students ranging from undergraduate to graduate level in experimental course projects and research projects.
◦ Communicated research results in multiple international conferences and seminars.

PUBLICATIONS

◦ Optical monitoring of neuronal activity at high frame rate with a digital Random-Access MultiPhoton (RAMP) microscope; Otsu Yo, Bormuth V, **Wong J**, Mathieu B, Dugu GP , Feltz A , Dieudonn S ; Journal of Neuroscience Methods, 2008, 173, 259-270.

◦ Plasmid copy number noise in monoclonal populations of bacteria.; **Wong Ng J**, Chatenay D, Robert J, Poirier MG. ; Phys Rev E Stat Nonlin Soft Matter Phys., 2010, 81, 011909.

◦ Inference of plasmid-copy-number mean and noise from single-cell gene expression data.; Ghozzi S, **Wong Ng J**, Chatenay D and Robert J ; Phys Rev E Stat Nonlin Soft Matter Phys, 2010, 82, 051916.

◦ Non-invasive inference of the molecular chemotaxis response from bacterial trajectories. Masson JB*, Voisinne G*, **Wong Ng J***, Celani A and Vergassola M, Proc. Nat. Academy Sciences, 2012, 109 ,1802-7. * equal contributors)

◦ Gene inactivation of a chemotaxis operon in the pathogen Leptospira interrogans. Lambert A, **Wong Ng J**, and Picardeau M,FEMS Microbiol. Lett. 2015 Jan ;362(3)

◦ The Role of Adaptation in Bacterial Speed Races. **Wong Ng J**, Melbinger A, Celani A and Vergassola M, Plos. Comp. Biol. 2016, 12(6): e1004974

◦ Exploring the function of bacterial chemotaxis. **Wong Ng J**, Celani A and Vergassola M, Current Opinion in Microbiology, 45(16-21), oct 2018

◦ Genome-wide CRISPR-Cas9 screen in E. coli identifies design rules for efficient targeting. Gutierrez B*, **Wong Ng J**,*, Cui L, Becavin C and Bikard D ; bioRxiv 308148 (* equal contributors)

◦ Glider soaring via reinforcement learning in the field. Reddy G*, **Wong-Ng J***, Celani A, Sejnovski T and Vergassola M, Nature 562 p236-239 . (* equal contributors)

◦ Chemotaxis as a navigation strategy to boost range expansion. Cremer J , Honda T , Tang Y , **Wong-Ng J** , Vergassola M and Hwa T. Nature (2019) doi:10.1038/s41586-019-1733-y

◦ On-target activity predictions enable improved CRISPR-dCas9 screens in bacteria. Calvo-Villaman A*, **Wong-Ng J***, Planel R, Ménager H, Chen A, Cui L and Bikard D. submitted (* equal contributors)