NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | Graduate College

Joint Projects

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | Graduate College

1. Distance estimation between SDE solutions and application to generative fractional diffusion models

Date Posted	11 March 2025	
Home University	Nanyang Technological University	
Partner University	Institut Polytechnique de Paris	
Supervisors	**Home**	**Partner**
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Project Description (200-300 words)	We aim to compute the Wasserstein distance between a nominal SDE and its counterpart for the approximate process. Our initial objective is to assess these distances at a fixed point in time. Subsequently, we will extend our findings to encompass the entire trajectories of the solutions. We plan to adapt strategies used for the Wasserstein-1 distance and for the adapted Wasserstein-2 metric. Our goal is then to devise new and more effective methods for generating fractional diffusive models.	
Program/Center Website(s)	NA	
Additional Information (e.g., files with project details)	NA	

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | Graduate College

2. Development of Transparent Thermal Energy Harvesting Systems for Smart Windows

Date Posted	1 July 2024	
Home University	Nanyang Technological University	
Partner University	Institut Polytechnique de Paris	
Supervisors	**Home**	**Partner**
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Project Title	**Development of Transparent Thermal Energy Harvesting Systems for Smart Windows**	
Project Description (200-300 words)	We are seeking passionate and innovative PhD candidates to join our groundbreaking project aimed at revolutionizing energy efficiency in buildings through the development of transparent thermal energy harvesting systems. This research focuses on harnessing infrared (IR) radiation from sunlight to generate electricity, providing a novel solution for smart windows in modern architecture. The core objective of this project is to design and implement advanced nanomaterials capable of absorbing IR radiation while allowing visible light to pass through, thus maintaining the transparency of conventional windows. These nanomaterials will be integrated into an electrochemical system to efficiently harvest low-grade heat and convert it into electrical energy. By selectively targeting IR radiation, a substantial component of solar energy that is typically wasted, this system promises to enhance the energy efficiency of buildings without compromising aesthetic or functional qualities. The project will investigate the synthesis and characterization of these innovative nanomaterials, focusing on their optical properties and ability to convert absorbed IR radiation into electrical energy through electrochemical processes. The successful integration of these materials into smart windows will reduce reliance on external power sources and lower overall energy consumption in buildings. Additionally, this system offers potential applications in various fields,	

	including automotive and electronic devices, where transparency and energy efficiency are crucial. This is a joint PhD program between Nanyang Technological University (NTU) and École Polytechnique, offering a unique opportunity to work in a collaborative international research environment. Candidates will gain expertise in nanomaterial synthesis, electrochemical systems, and energy conversion processes. They will have access to state-of-the-art facilities and resources at both institutions, contributing to publications in high-impact scientific journals.
Program/Center Website(s)	NA
Additional Information (e.g., files with project details)	Tentative training plan.pdf