



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE 6291

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Matematica Federigo Enriques**

Scientist- in - charge: Prof. Campi Luciano

Berk Tan Perçin

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Perçin
Name	Berk Tan

PRESENT OCCUPATION

Appointment	Structure
PhD Candidate	Statistical Sciences "Paolo Fortunati", University of Bologna

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Bachelors	Molecular Biology and Genetics	Bilkent University, Turkey	June 2019
Master	Physics	University of Bologna	October 2021
PhD	Statistics	University of Bologna	October 2024
Other	Physics Minor Program	Bilkent University, Turkey	June 2019

FOREIGN LANGUAGES

Language	Level
English	C1
Italian	A2
German	A1



AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

2014	Comprehensive Scholarship due to University Entrance Exam from Bilkent University
2017	Best project award, Physics department Bilkent University

TRAINING OR RESEARCH ACTIVITY

With my supervisor Prof. Alberto Lanconelli, we studied the reaction diffusion systems using the so called “Chemical Diffusion Master Equation” (CDME), which is a way to model these types of systems. Although CDME is utilized widely in literature, the analytic solution for even simple reactions are not present. Moreover, the explicit derivation of the model is also not formally shown anywhere. With my supervisor we basically derived the model from scratch by using some assumptions on the reactions and we were able to solve the equation analytically for some simple reactions like birth and death type reactions. The solution step heavily includes stochastic analysis and elements from Malliavin Calculus. Lastly we analyzed branching Brownian motion from a CDME point of view and we were able to find an explicit solution to the Fisher-Kolmogorov-Petrovskii-Piskunov equation. We have 3 preprints where we’re waiting for journals to finish their review process. We will work on stochastic gradient descent algorithm in my last year.

PROJECT ACTIVITY

Year	Project
2022	Solution of birth-death type Chemical Diffusion Master Equation
2023	Derivation and analysis of CDME for mutual annihilation type of reactions
2024	The solution of Branching Brownian Motion via CDME approach

PUBLICATIONS

Articles in reviews
On a new method for the stochastic perturbation of the disease transmission coefficient in SIS models, review, <i>Applied Mathematics and Computation</i> 413 (126600), Elsevier, 2022
Solution formula for the general birth-death chemical diffusion master equation, arXiv:2302.10700, https://doi.org/10.48550/arXiv.2302.10700
Probabilistic derivation and analysis of the chemical diffusion master equation with mutual annihilation, arXiv:2306.05139, https://doi.org/10.48550/arXiv.2306.05139
A new look to branching Brownian motion from a particle based reaction diffusion dynamics point of view, arXiv:2401.11045, https://arxiv.org/abs/2401.11045

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Please note that CV WILL BE PUBLISHED on the University website and It is recommended that personal and sensitive data should not be included. This template is realized to satisfy the need of publication without personal and sensitive data.

Please DO NOT SIGN this form.

Place and date: Bologna, 19.01.23