

Funded Ph.D. position in applied mathematics and
engineering
Oklahoma State University

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Posted May 25, 2020, set to expire Sep. 24, 2020

Job Title	Funded Ph.D. position in applied mathematics and engineering
Department	Mechanical and Aerospace Engineering https://scc.okstate.edu
Institution	Oklahoma State University Stillwater, Oklahoma
Date Posted	May 25, 2020
Application Deadline	Jan. 1, 2021
Position Start Date	Available Immediately
Job Categories	Graduate Student
Academic Field(s)	Mathematics/Applied Mathematics
Job Website	https://scc.okstate.edu/jobs/afosr2020
Apply Online Here	https://scc.okstate.edu/apply

Apply By Email

Job Description

The Systems, Cognition, and Control Lab (<https://scc.okstate.edu>) in the School of Mechanical and Aerospace Engineering at Oklahoma State University is looking for a qualified candidate, preferably with a Master's or a Bachelor's degree in pure or applied mathematics. The position is for a research project concerning applications of functional analysis and operator theory to data-driven modeling and control of robotic systems. In this project, the aim is to develop novel operator theoretic techniques for data and model-driven synthesis of control policies through synthesis of CLFs and solution of optimal control problems. The proposed technical tasks focus on the use of trajectories (i.e., time-series) as the fundamental unit of data for the resolution of control synthesis and certification problems in dynamical systems. Trajectory information in the dynamical systems is embedded in a reproducing kernel Hilbert space (RKHS) through what will be called occupation kernels. The occupation kernels are tied to the

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dynamics of the system through the densely defined Liouville operator. The pairing of Liouville operators and occupation kernels results in an operator theoretic framework that allows for nontrivial information concerning the dynamical systems to be extracted from the RKHS.

For an introduction to the research ideaa pursued in this project, see our preprints <https://arxiv.org/abs/1910.03977> and <https://arxiv.org/abs/1909.11792>.

The project is funded by AFOSR.

Prior experience in analysis including, but not limited to, coursework in advanced calculus, real analysis, and functional analysis will weigh highly in your favor. Once you are here, we will make sure you get the relevant engineering experience to be successful.

If you are interested, please submit an application at <https://scc.okstate.edu/apply> and select Operator theory, spectral analysis, POD, DMD, Koopman operators, etc. as your topic of interest.

EEO/AA Policy

Please review our website (<https://eeo.okstate.edu/>) and contact the Office of Equal Opportunity, 408 Whitehurst at 405-744-9154, for information concerning unlawful discrimination and inquiries regarding OSU compliance with equal opportunity or affirmative action.

Contact Information

Please reference Academickeys in your cover letter when applying for or inquiring about this job announcement.

Contact Rushikesh Kamalapurkar
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