UNIVERSITÀ DI PISA
DIPARTIMENTO DI INGEGNERIA
CIVILE E INDUSTRIALE

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Pisa, December 8th, 2024

Subject: Appointment as Opponent in Inauguration Proceedings

Candidate: doc. Ing. Juraj Oravec, PhD (associate professor)
Position of application: professor of Automation at the Institute of Information Engineering, Automation, and Mathematics, FCHPT, STU

I prepared the opinion based on the authorization of the Chairman of the Scientific Board of the FCHFT (Bratislava), Prof. Ing. Anton Gatial Dr. Sc., Reference no. 13555/2024 dated October 25, 2024.
I received the following documents:

- Selected scientific papers (printed and electronically)
- Applicant's CV (electronically)
- List of publications and citations (electronically)
- Overview of teaching activities (electronically)

Introduction

I am a full professor of Chemical Engineering at the University of Pisa, where I teach and conduct research in process modeling, optimization, and control. Currently, I hold the position of President of the School of Engineering and serve as Senior Editor for the Journal of Process Control.
I became acquainted with the applicant in 2022 at the commencement of the EU-funded research project "FrontSeat," which involves collaboration between STUBA, UNIPI, and Ruhr University of Bochum.

Juraj Oravec completed his education at the University of Science and Technology of Bratislava. He graduated in 2010 with an MSc in Automation and Information Engineering in Chemistry and Food Industry. He then pursued a PhD in Process Control, which he completed in 2014. Following this, he held two Research Scientist positions from 2014 to 2016 and 2016 to 2019. In 2019, he was appointed as an Associate Professor. He received several awards, mostly from STUBA for his studies and research.

Evaluation of teaching activity

The applicant's teaching career commenced during his PhD studies, wherein he served as a teaching assistant (lecturer) for various laboratory courses. This role was maintained throughout his tenure as a Research Scientist. Upon his appointment as an Associate Professor, he assumed the position of primary instructor for six distinct courses in the fields of Modeling, Process Control, and Robust Control.

Dr. Oravec has supervised three PhD theses since 2020, one of which is still ongoing. Additionally, one of these theses received an award from the STUBA rector. This highlights Dr. Oravec's dedication to guiding and mentoring students through their doctoral research, as well as the recognition of the quality of work produced under his supervision.

He also supervised twelve MSc theses since 2018, as well as nince BSc theses. Seven of these MSc theses won an award. Three university textbooks and ten didactic publications, all in Slovak language, complement Dr. Oravec's teaching activity.

Overall, Dr. Oravec's teaching quality is characterized by his gradual and extensive experience, the recognition of his students' work, and his contributions to educational resources. His consistent involvement in teaching, supervision of award-winning theses, and development of educational materials is remarkable.

Evaluation of scientific activity

Dr. Oravec scientific activity is testified[1] by 82 publications, which received more 1000 citations, and an overall h-index of 12. The publications are coauthored more than 50 different research, national and international. These publications include 35 articles, 1 review (which received nearly 500 citations), 43 conference papers, and three book chapters. In general, the journal articles are published in relevant journals of the field, such as Automatica, Journal of Process Control, Computers and Chemical Engineering, IEEE Transactions on Automatic Control, Energy.

Dr. Oravec presented 10 publications for detailed evaluation. All of these articles are published in top journals, and the research topics can be grouped into:

- **Fast implementation of linear MPC algorithms**: Dr. Oravec has worked on the fast implementation of linear Model Predictive Control (MPC) algorithms (#1, #2), possibly in embedded hardware (#9), and explicit control law generation (#2, #6).
- **MPC applications to thermal control**: He has applied MPC to thermal control in buildings and heat exchangers. For example, his research includes optimizing the

[1] According to the Scopus database

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thermal control in buildings to improve energy efficiency and applying MPC to heat exchangers to enhance their performance (#4, #5, #10).

- **Robust control**: Dr. Oravec has also contributed to the field of robust control, ensuring that control systems can handle uncertainties and maintain performance (#8, #10).

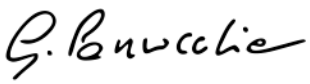
In most of these articles, the contribution of Dr. Oravec is quite significant (at least 25%-33%), and a general clarity of presentation can be witnessed.

Overall evaluation

Dr. Oravec's teaching and scientific research activities affirm that he is a good researcher and a very good pedagogical figure, possessing the qualities expected of a university professor. Based on a thorough evaluation of all relevant documents, it can be concluded that the applicant meets the criteria and indicators required by the Slovak University of Technology in Bratislava for professorship appointments.
For these reasons, I recommend approving the proposal for the appointment of Dr. Ing. Juraj Oravec as Professor of Automation at the Institute of Information Engineering, Automation, and Mathematics, FCHPT, STU.

Yours faithfully

(Prof. Gabriele Pannocchia)



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