

Modeling of nonholonomic multibody robotic systems using geometric mechanics methods

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Abstract:

The dynamics of multibody systems is in general described by complex nonlinear equations. These equations are often unsuitable for design and analysis of controls. The equations also provide little information on important dynamic properties like invariance of quantities. The latest knowledge in geometric mechanics provides effective means to formulate equations of motion as well as understanding of important properties of their dynamics. This approach uses the symmetry of multibody robotic systems which allows simplification of the equations of motion resulting from the invariance of these equations of motion from definite quantities. Presentations will show a specific example of motion and detailed information about the research group of prof. Gmíterko who are solving this problem.

About the speaker:

Erik Prada has worked for ZTS VVÚ Košice, a.s. since 2016, first as a design engineer, then as a mechanical engineer, and currently as a project designer. In addition, since he joined the company he has participated in the preparation of projects MASYKO, Innovation Support in ZTS VVÚ KOŠICE, a.s, and INOTRANS as the main project manager. At the same time he has been collaborating with the Slovak Academy of Science PROMATECH institute in Košice on the preparation of strategic projects EXTREMAT and ICT4INDUSTRY4.0 within the Operational Programme Research and Innovation. Currently he is involved in the implementation of the project –Research and development of smart mobile robotic platforms and high-precision positioning systems for application in research, development and industry and in the commission of Construction of dry storage for spent nuclear fuel on the premises of Jaslovské Bohunice nuclear power plant. He has several years of experience in research projects in this country and abroad. Previously he has worked as a science researcher at the Faculty of Mechanical Engineering at the Czech Technical University in Prague where he was a part of an international post-doc team. He is considered an expert in the field of designing mechatronic systems and his specialization is the area of underactuated robotic systems. During his research career he has participated in creating VEGA and KEGA projects and project grant foundations. He is the author and co-author of over 61 scientific publications in Slovakia and abroad. He is also one of the authors in four pending patents and a holder of several awards. Erik Prada also works as an external expert for Cluster for Automation Technologies and Robotics AT+R.

Presenter: PRADA, Erik (ZTS VVU, Cluster AT+R)

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