Introduction

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Biographical notes: Alessandro Tasora is an Associate Professor at the Department of Engineering and Architecture at the University of Parma. His research interests include applied mechanics, numerical methods for multibody simulation, robotics and tribology. He is a main architect of the Chrono software, which he started in 1997. He is Member of ASME Technical Committee on Multibody Systems and Nonlinear Dynamics.

The increasing interest of research institutions and companies for open source software (OSS) is motivated by several factors, not least the cost-effectiveness of OSS licenses. Other relevant benefits of OSS are the possibility of collaborative development, the ease of debugging and documentation, the absence of vendor locks-in and interaction with large user groups.

In the context of mechanical simulation, ProjectChrono represents a viable OSS option. ProjectChrono is a physics library, entirely written in C++, which provides functions for the simulation of general-purpose multi-body systems. Optional modules extend its capabilities, adding features such as non-linear finite elements, cosimulation, Python interface, parallel computing and fluid-structure interaction. Among the most recent additions, the module for vehicle dynamics provides an extensive set of functions for template-based modelling of wheeled or tracked vehicles, including tyre models and 1D components for powertrains and drivelines.

Initially developed by researchers at the Politecnico di Milano, University of Parma and University of Wisconsin-Madison, the ProjectChrono library is gaining a growing popularity globally among various research centres. It is currently used in contexts such as robotics, automation, biomechanics and aerospace engineering, with vehicle dynamics currently being one of the most relevant areas of application. This motivates this special issue of *IJVP* where different authors used ProjectChrono in their research on vehicle performance, showing a snapshot of the current achievements and suggesting where future development can be of benefit.