

Preface

This book is a compendium of the articles presented at the Third International Conference on Cable-Driven Parallel Robots, also known by its diminutive CableCon2017, held at Université Laval, Quebec City, Canada. The first two conferences of this series were both held in Germany, respectively, in Stuttgart, in 2012, and in Duisburg, in 2014. It is therefore the first time that the conference leaves the European continent, which we hope will be an occasion to foster new links with researchers from the Americas.

Some readers may be left wondering as to the nature of the cable-driven parallel robots mentioned in the conference title. In general, these parallel robots are made of a rigid mobile platform attached to a fixed frame by several cables acting in parallel, their lengths being controlled by servo-actuated winches. These robots and their variants are the topic of CableCon2017. In the past decade, cable-driven parallel robots have attracted a renewed interest from the research community and from industry. This may be seen from the number of researchers who took part in the first editions of CableCon, but also from scientific literature and from the various industrial projects that were undertaken during these years. This interest stems from several advantages that are widely recognised to favour cable-driven parallel robots over others: large workspace, low cost, good dynamic properties, reconfigurability, portability, and compatibility with vision systems.

Yet, as much as these advantages are enticing, several issues have hindered the development of effective cable-driven parallel robots. Some of these issues have been the subject of significant progress, e.g. workspace determination, cable tension resolution, and winch design. Others still pose important challenges to researchers, despite remarkable efforts to solve them, e.g. forward displacement analysis, vibration control, accuracy, interferences. Moreover, cable-driven parallel robots remain unknown or have only been partially tested in several applications where they promise great leaps in efficiency.

In this context, we believe that CableCon2017 can provide a stimulating forum for the exchange of ideas, of potential applications, and of key challenges that remain to be addressed, just as were the first two editions of the conference. We deem the articles included in this book to be of excellent quality, which allows us to

foresee fruitful presentations and discussions. The articles are distributed into four themes: modelling; displacement and workspace analysis; trajectory planning and control; design and applications. Under these themes, one should find all the main engineering challenges that need to be resolved to allow cable-driven parallel robots to reach their full potential. We hope that this conference can be useful in taking one more step towards this goal.

Finally, we would like to express our gratitude to all the authors for their valuable contributions and to all the reviewers and scientific committee members for their expertise and selfless efforts in maintaining the standards of the conference.

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