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Herwig Unger (Ed.)

Autonomous Systems 2019: An Almanac



FernUniversität in Hagen
Schriften zur Informations-
und Kommunikationstechnik

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Since 2010 it became a good tradition that colleagues from different research areas publish articles about their unsolved scientific problems, on-going work or research results in a joint book with the title "Autonomous Systems". Those systems exist in several areas of science, describing self-contained and self-controlled groups of possibly interacting or interrelated entities that form unified ensembles acting in given environment without outer control of any higher instances, leaders or managers.

In this year, three major topics are presented, which are valiant, strongly interfering with politics and everyone's discussion and are, therefore, rarely considered without emotions or political and financial concerns: the climate on our planet earth, ethics in the context of applying and using autonomous systems as well as problems of (mostly individual) road traffic. The following contributions deal with various topics related to theory, fundamentals, natural language and image processing as well as simulation.

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Preface

Since 2010 it became a good tradition that colleagues from different research areas submit and publish articles about their unsolved scientific problems, ongoing work or research results in a joint book “Autonomous Systems” published by VDI-Verlag in Düsseldorf. When the editors were looking for a suitable title as a framework for these contributions they found that the term “autonomous systems” exists in several areas of science, describing self-contained and self-controlled groups of possibly interacting or interrelated entities that form unified ensembles acting in given environment without outer control of any higher instances, leaders or managers. The books prepared in the beginning as proceedings of the workshop and conference with the same title held each year on Majorca Island in October slowly changed their character to real, interdisciplinary almanacs. Now, authors can contribute to it without an obligation to participate or present their work at the conference. Moreover, the book is free of any reviews or censorship what shall motivate especially people thinking off the mainstream to submit their work. The book is distributed among the conference participants and shall be a motivation for free, unbiased discussion at the conference in Cala Millor. It shall remind everyone that dispute and competition of opinions is one, maybe the most important root of science, where decisions cannot be made by majority voting or compromises. Therefore, the search for the truth or the best, most efficient solution can even significantly be guided by the opinion or ideas of a single outsider or specialist in a completely other area of science, which may win over the majority of renowned specialists.

The editors are glad that the three keynotes presentation contained in this volume are touching three research fields, which are valiant, strongly interfering with politics and everyone’s discussion and are, therefore, rarely considered without emotions or political and financial concerns: the climate on our planet earth, ethics in the context of applying and using autonomous systems as well as problems of (mostly individual) road traffic.

The following three chapters deal with natural language processing, fundamentals and theory as well as image processing. Although at first glance these topics seems to be very different, they are connected by two facts the authors emphasize. First, interfaces become increasingly human-like: people get used to program or to interact with machines in their natural languages, either in written

or in spoken form, and cameras are employed as eyes of or visual interfaces to computers. Secondly, as a consequence, the amount of data available in big data bases, the size of the systems to be managed as well as the computing performance needed are increasing rapidly.

As in the last years, the editor wants to say thank you to Mrs. Barbara Kleine and Mrs. Jutta Düring for their caring support in all technical and organisational details needed to finish this book and bring all authors and interested people together at our conference in Cala Millor. We hope that all of you will enjoy the results of our work and support us with your ideas and work in 2020 again.

Hagen, August 2019
Herwig Unger

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