KU LEUVEN

CYBPHYS

e-book 2

Mathematical modelling of mechatronic systems.

Joan Peuteman

ZOOM meeting: January 12th (2021).

Erasmus+: Development of practically-oriented student-centred education in the field of modelling of Cyber-Physical Systems (CybPhys)

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Mathematical modelling of mechatronic systems

The e-book will contain 14 chapters.

The e-book is a collaboration of 4 universities with contact persons:

- UCY: University of Cyprus: Nikolas Flourentzou
- RTU: Riga Technical University: Nadezda Kunicina
- KU Leuven: Joan Peuteman
- GSU: Gomel State University: Dmitry Kovalenko
- BSU: Belarusian State University: Denis Marmysh

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Input from University of Cyprus:

- Chapter 2.2: SCADA in power system control centres: **final version is available**

- Chapter 2.3: Cyber-physical security in power systems: **final version is available**

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Input from Riga Technical University:

- Chapter 2.14: Simulation of public transport overhead network losses: **final version is available**

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Input from KU Leuven:

- Chapter 2.7: Dynamic modelling of linear systems: **final version is available**
- Chapter 2.8: Dynamic modellig of nonlinear systems: **final version is available**
- Chapter 2.9: Engineering design and optimizations with genetic algorithms: **final version is available**
- Chapter 2.13: Traditional and genetic algorithm based PID tuning: **final version is available**

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Input from Gomel State University:

- Chapter 2.1: Acquisition of software packages: COMSOL, Multiphysics, FEMM, CST, solvers based on MECM, MATLAB and Simulink: **text is not available yet**
  (author: Gennadiy Tjumenkov)

- Chapter 2.4: Relaxation theory of friction and wear processes of metal-polymer conjugations: **final English version is available**
- (author: Alexander Rogachev)

Mathematical modelling of mechatronic systems

Input from Gomel State University:

- Chapter 2.5: Modelling of mechanical systems with constraints in Lagrangian formalism: **English text is available** (author: Oksana Deruzhkova)

- Chapter 2.6: Kinematic and Dynamical Mechanical Systems: **text is not available yet** (author: Oksana Deruzhkova)

- Chapter 2.11: Analytical and numerical solutions of the equations of motion for mechanical systems: **final version is available** (author: Andreev Viktor)

Mathematical modelling of mechatronic systems

Input from Belarusian State University:

- Chapter 2.10: Virtual laboratory practices for mathematical modeling of mechanical systems: **Russian version exists, translation is not available yet** (author: Sergey Bosiakov)

- Chapter 2.12: Fundamentals of Biomechanical Modeling: **Russian version exists, translation is not available yet** (author: Sergey Bosiakov)

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TODO:

- Finalizing the remaining chapters in English.
  - @ contact persons: do you have information?
  - @ authors: do you have information?

- The order of the chapters need to be changed.

- Joining all chapters together with the appropriate layout.

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Thank your for your attention!

Questions?

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