

Preface

This booklet provides supplementary material to the textbook

JAN LUNZE: *Networked Control of Multi-Agent Systems*,
Edition MoRa 2022 (2nd ed.), ISBN 9789403648477.

Twelve application studies illustrate how the methods explained in the text can be used to solve practical problems. Whereas the examples and exercises of the textbook stick to the assumptions and the models used when introducing the theory of networked control systems, the application studies broaden the view on more general system classes, higher-order dynamics of the agents and more involved control aims.

There is no unique solution to the problems stated, but the readers may follow different ways of thinking, modify the assumptions or extend the control problems for other restrictions or specifications. The solutions given in this booklet provide only one of several views on the practical problems considered.

Each application study starts with the problem description and outlines the way of solution. All modelling, analysis and design steps are explained in detail and illustrated by simulation results. The outcomes of the application studies are discussed with respect to a further generalisation, and hints to important references are given.

These application studies may be used for student projects in parallel to lectures held in accordance with the textbook. Some of them have been discussed at the 2020 International Graduate School on Control of the European Embedded Control Institute and used in seminars in industry.

Notation. To distinguish a cross-referencing within this booklet from references towards the textbook, the figures and equations given in the following chapters have a single number, whereas the enumerations of the text include the chapter number. For example, eqn. (3.24) points to the equation with the given number in Chapter 3 of the textbook and eqn. (3) to a formula in the same application study within this supplementary material. The same convention applies to figures and sections.

Münster, in January 2022

JAN LUNZE

The webpage www.editionmora.de/ncs offers additional material including the MATLAB scripts for generating the figures of this booklet.

