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| Modulbezeichnung | Introduction to System Identification | | | | | | | | |
| Modulverantwortliche(r) | Matthew Hoelzel | | | | | | | | |
| Modulart | Pflicht/Wahl <input type="checkbox"/> Wahlpflicht <input checked="" type="checkbox"/> | | | | | | | | |
| Spezialisierungsbereich | Mechatronik | | | | | | | | |
| Dauer des Moduls | 1 Semester | | | | | | | | |
| Kreditpunkte | 4 CP | | | | | | | | |
| Arbeitsaufwand | <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">Berechnung des Workloads</td> </tr> <tr> <td style="width: 80%;">Präsenz</td> <td style="text-align: right;">42 h</td> </tr> <tr> <td>Übungsbetrieb/Prüfungsvorbereitung</td> <td style="text-align: right;">78 h</td> </tr> <tr> <td style="border-top: 1px solid black;">Summe</td> <td style="text-align: right; border-top: 1px solid black;">120 h</td> </tr> </table> | Berechnung des Workloads | | Präsenz | 42 h | Übungsbetrieb/Prüfungsvorbereitung | 78 h | Summe | 120 h |
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| Präsenz | 42 h | | | | | | | | |
| Übungsbetrieb/Prüfungsvorbereitung | 78 h | | | | | | | | |
| Summe | 120 h | | | | | | | | |
| Turnus des Moduls | in der Regel in jedem SoSe | | | | | | | | |
| Voraussetzung für die Teilnahme | Keine <input type="checkbox"/> Folgende <input type="checkbox"/> Formale Voraussetzungen: Keinelinhaltliche Voraussetzungen: A brief knowledge of linear systems and statistics. | | | | | | | | |
| Lehr- und Lernformen | Seminar <input type="checkbox"/> Vorlesung <input checked="" type="checkbox"/> Tutorium <input checked="" type="checkbox"/> Praktikum <input type="checkbox"/> Projekt <input type="checkbox"/> | | | | | | | | |
| Lernziele | <ul style="list-style-type: none"> • To understand the basic system identification process, which involves a combination of model selection, data analysis, and noise assumptions. • To acquire a knowledge of several system identification techniques, and to understand when each method is applicable. • To understand the effect of the model, noise, and system identification on the estimated model, that is, to understand the effects of the assumptions used to obtain a model estimate. | | | | | | | | |
| Lerninhalte | <ul style="list-style-type: none"> • Typical model structures used in system identification: state-space, polynomial matrix, impulse response, and frequency domain models. • Model properties: controllability, observability, reachability, and linearity. • Requirements for the identifiability of a model, specifically, persistency. • Regression and least-squares analysis for linear-in-the-parameters models. • Consistency of estimated models and other useful statistical properties. • Parameter estimation methods such as instrumental variable methods. | | | | | | | | |
| Prüfungsformen | i.d.R. Bearbeitung von Übungsaufgaben und Fachgespräch oder mündliche Prüfung | | | | | | | | |
| Literatur | <ul style="list-style-type: none"> • C. T. Chen, "Linear System Theory and Design", 3rd ed. New York: Oxford University Press, 1999. • M. Verhaegen and V. Verdult, "Filtering and System Identification: A Least Squares Approach", 1st ed. New York: Cambridge University Press, 2007. • L. Ljung, "System Identification: Theory for the User", 3rd ed. Upper Saddle River, NJ: Prentice-Hall, 1999. • R. Pintelon and J. Schoukens, "System Identification: A Frequency Domain Approach", 1st ed. New York: Wiley-IEEE Press, 2001. | | | | | | | | |