

<b>Introduction to System Identification</b>							Modulnummer: ME-699.08				
<i>Introduction to System Identification</i>											
<b>Master</b> Pflicht/Wahl <input type="checkbox"/> Wahl <input checked="" type="checkbox"/> Basis <input type="checkbox"/> Ergänzung <input checked="" type="checkbox"/> Sonderfall <input type="checkbox"/>				Zugeordnet zu Masterprofil Basis Ergänzung Sicherheit und Qualität (SQ) <input type="checkbox"/> <input type="checkbox"/> KI, Kognition, Robotik (KIKR) <input type="checkbox"/> <input checked="" type="checkbox"/> Digitale Medien und Interaktion (DMI) <input type="checkbox"/> <input type="checkbox"/>							
Modulbereich: Mathematik und Theoretische Informatik											
Modulteilbereich: 699 Spezielle Gebiete der Theoretischen Informatik											
Anzahl der SWS		V	UE	K	S	Prak.	Proj.	$\Sigma$	Kreditpunkte: 4	Turnus in der Regel in jedem SoSe	
		2	1	0	0	0	0	3			
Formale Voraussetzungen: Keine											
Inhaltliche Voraussetzungen: A brief knowledge of linear systems and statistics.											
Vorgesehenes Semester: ab 1. Semester											
Sprache: Englisch											
<b>Ziele:</b> <ul style="list-style-type: none"> <li>To understand the basic system identification process, which involves a combination of model selection, data analysis, and noise assumptions.</li> <li>To acquire a knowledge of several system identification techniques, and to understand when each method is applicable.</li> <li>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.</li> </ul>											
<b>Inhalte:</b> <ul style="list-style-type: none"> <li>Typical model structures used in system identification: state-space, polynomial matrix, impulse response, and frequency domain models.</li> <li>Model properties: controllability, observability, reachability, and linearity.</li> <li>Requirements for the identifiability of a model, specifically, persistency.</li> <li>Regression and least-squares analysis for linear-in-the-parameters models.</li> <li>Consistency of estimated models and other useful statistical properties.</li> <li>Parameter estimation methods such as instrumental variable methods.</li> </ul>											
<b>Unterlagen (Skripte, Literatur, Programme usw.):</b> <ul style="list-style-type: none"> <li>C. T. Chen, "Linear System Theory and Design", 3rd ed. New York: Oxford University Press, 1999.</li> <li>M. Verhaegen and V. Verdult, "Filtering and System Identification: A Least Squares Approach", 1st ed. New York: Cambridge University Press, 2007.</li> <li>L. Ljung, "System Identification: Theory for the User", 3rd ed. Upper Saddle River, NJ: Prentice-Hall, 1999.</li> <li>R. Pintelon and J. Schoukens, "System Identification: A Frequency Domain Approach", 1st ed. New York: Wiley-IEEE Press, 2001.</li> </ul>											
<b>Form der Prüfung:</b> i.d.R. Bearbeitung von Übungsaufgaben und Fachgespräch oder mündliche Prüfung											
Arbeitsaufwand		Präsenz		42 h		Übungsbetrieb/Prüfungsvorbereitung		78 h		Summe	120 h
Lehrende: Matthew Hoelzel						Verantwortlich: Matthew Hoelzel					