

Dipl.-Ing. Helmut Niederwieser, BSc.

born in 1993 in Lienz (A)

Education and Experience

- since 2019 Researcher at the competence centre BEST – Bioenergy and Sustainable Technologies GmbH
Area: Automation and Control
- 2019-2022 Junior Researcher at the competence centre BEST – Bioenergy and Sustainable Technologies GmbH
Area: Automation and Control
- since 2019 Project assistant at the Institute of Automation and Control, Graz University of Technology
Held lectures and supervised theses:
 - *Signal Transforms (UE)*
 - *Several Bachelor's Theses*
- since 2019 Ph.D. in control engineering at Graz University of Technology
Thesis: *State- and Parameter Estimation in Thermo-chemical and Thermo-technical processes*
- 2017-2019 M.Sc. in *Information and Computer Engineering* at Graz University of Technology
Master thesis: *Design and Analysis of Robust Homogeneous Control Systems*
- 2015-2019 Study assistant at Graz University of Technology
 - *Analysis T1 (UE)* - Institute of Analysis and Number Theory
 - *Numerisches Rechnen und lineare Algebra (UE)* - Institute of Analysis and Number Theory
 - *Messtechnik Labor (LU)* - Institute of Electrical Measurement and Sensor Systems
 - *Grundlagen Elektrotechnik Labor (LU)* - Institute of Electrical Measurement and Sensor Systems
 - *Signal Analysis (LU & UE)* - Institute of Electrical Measurement and Sensor Systems
 - *Non-linear Control Systems (UE)* - Institute of Automation and Control
 - *Control of Biomedical Instrumentation (UE)* - Institute of Automation and Control
 - *Signal Processing (UE)* - Institute of Signal Processing and Speech Communication
- 2013-2017 B.Sc. in *Information and Computer Engineering* at Graz University of Technology
Bachelor thesis: *Control of a modular multi-channel Power Supply*
- 2012 A-levels at PHTL Lienz, Mechatronics

Research Areas:

- State, disturbance and parameter estimation in combustion and thermal processes
- Fundamental research in robust state and disturbance estimation of dynamical multivariable systems

Selected Publications:

- Andritsch, B., Horn, M., Koch, S., Niederwieser, H., Wetzlinger, M., & Reichhartinger, M. (2021, March). The Robust Exact Differentiator Toolbox revisited: Filtering and Discretization Features. In *2021 IEEE International Conference on Mechatronics (ICM)* (pp. 01-06). IEEE.
- Niederwieser, H., Tranninger, M., Seeber, R., & Reichhartinger, M. (2022). Unknown input observer design for linear time-invariant multivariable systems based on a new observer normal form. *International Journal of Systems Science*, 1-27.
- Niederwieser, H., Zemann, C., Goelles, M., & Reichhartinger, M. (2020). Model-Based Estimation of the Flue Gas Mass Flow in Biomass Boilers. *IEEE Transactions on Control Systems Technology*.
- Niederwieser, H., Zemann, C., Gölles, M., & Reichhartinger, M. (2020). Soft-Sensor for the On-Line Estimation of the Flue Gas Mass Flow in Biomass Boilers with Additional Monitoring of the Heat Exchanger Fouling. In *28th European Biomass Conference & Exhibition* (pp. 280-284).
- Niederwieser, H., Koch, S., & Reichhartinger, M. (2019, December). A Generalization of Ackermann's Formula for the Design of Continuous and Discontinuous Observers. In *2019 IEEE 58th Conference on Decision and Control (CDC)* (pp. 6930-6935). IEEE.
- Reichhartinger, M., Koch, S., Niederwieser, H., & Spurgeon, S. K. (2018, July). The robust exact differentiator toolbox: Improved discrete-time realization. In *2018 15th International Workshop on Variable Structure Systems (VSS)* (pp. 1-6). IEEE.