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.