



# Viktor Unterberger

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## Education and Employment

since 2014	<b>Scientific employee</b> at the competence centre BEST – Bioenergy and Sustainable Technologies GmbH (former Bioenergy 2020+ GmbH) Area of Automation and Control Field of activity: Modeling and control of sustainable energy systems
since 2018	<b>Senior Researcher</b> 2022 – Task Manager of the international IEA-SHC Tasks 68 <i>Efficient Solar District Heating Systems</i>
2016-2018	<b>Researcher</b> 2017 – Entry into the <i>Circle of Excellence (CoE) Program</i> 2016 – Participation at European Forum Alpbach
2013-2016	<b>Junior Researcher</b> 2014 – Participation at ESEIA International Summer School (Brașov, Rumänien)
2014-2021	<b>Ph.D.</b> in Control Engineering at Graz University of Technology (completed with honours) <i>Ph.D. title: Modelling and control of large-scale solar thermal systems</i>
2006-2013	<b>M.Sc. in telematics</b> at Graz University of Technology with specialisation in control system theory (Dipl.-Ing.) (completed with honours) <i>Master Thesis: Modelling and control of biomass furnaces with steam boiler</i>
2013	Scholarship of Graz University of Technology
2011	Merit-based scholarship at Graz University of Technology
2011-2012	Semester abroad in South Korea <i>POSTECH – Pohang University of Science &amp; Technology</i>
2005	A-levels at BG/BRG Lichtenfels Gymnasium (Matura)

## Research Areas

- Modelling and simulation of hydraulic and thermal components
- Control of solar thermal systems
- Control of hydraulic systems
- Control of hybrid systems

## Participation in the Supervision of Scientific Theses

### Ph.D. theses (in progress)

ZLABINGER, S.: Arbeitstitel: Modelling and control of absorption heat pumping systems, Technische Universität Graz (geplante Einreichung: Juni 2022)

### Master Theses (completed)

POMS, U.: Entwicklung eines Testsystems für Wärmeerzeuger in hydraulischen Heizungssystemen, Technische Universität Graz. (2019)

NIGITZ, T.: Modellierung und Prognose des Wärmebedarfs von Gebäuden und Wärmenetzen, Technische Universität Graz. (2015)

OBERLECHNER, F.: Entwicklung eines modellbasierten Optimierungsalgorithmus für eine Wärmeversorgungsanlage mit Biomasse-Feuerung, Technische Universität Graz. (2014)

HEMMER, J.: Modellierung und Regelung von Pufferspeichern in Biomasseheizungen, Technische Universität Graz. (2014)

## Selected Publications

ZLABINGER S., UNTERBERGER V., GÖLLES M., HORN M., WERNHART M., RIEBERER R., (planned submission 2022): *Modeling of a LiBr/H<sub>2</sub>O absorption heat pumping system for control purposes and experimental validation*. Journal of Process

UNTERBERGER V., LICHTENEGGER K., KAISERMAYER V., GÖLLES M., HORN M., 2021: *An adaptive short-term forecasting method for the energy yield of flat-plate solar collector systems*. Applied Energy, Vol. 293, 116891, ISSN 0306-2619, <https://doi.org/10.1016/j.apenergy.2021.116891>.

ZLABINGER S., UNTERBERGER V., GÖLLES M., HORN M., WERNHART M., RIEBERER R., 2020: *Development and experimental validation of a linear state-space model for absorption heat pumping systems for model-based control strategies*. ISHPC 2021 proceedings – online conference 2020. Meyer, T. (Hrsg.). Technische Universität Berlin, S. 191-195.

UNTERBERGER V., MUSCHICK D., LOIDL A., POMS U., GÖLLES M., HORN M., 2020: *Model-based control of hydraulic heat distribution systems – Theory and application*. Control Engineering Practice, Vol. 101, 104464, ISSN 0967-0661, <https://doi.org/10.1016/j.conengprac.2020.104464>.

UNTERBERGER V., NIGITZ T., LUZZU M., MUSCHICK D., GÖLLES M., 2018: *Adaptive methods for energy forecasting of production and demand of solar assisted heating systems*, Proceeding of Papers Vol. 1, p170-181, International conference on time series and forecasting, Granada, Spain, September 19-21, 2018.

UNTERBERGER V., LICHTENEGGER K., INNERHOFER P., GERARDTS B., GÖLLES M., 2017: *Evaluation of the potential for efficiency increase by the application of model-based control strategies in large-scale solar thermal plants*. International Conference & Workshop REMOO 2017, Venedig, Italien

UNTERBERGER V., MUSCHICK D., GÖLLES M., 2017: *Model-Based Control Strategies for an Efficient Integration of Solar Thermal Plants into District Heating Grids*, SWC 2017 / SHC 2017 ISES Conference Proceedings.

UNTERBERGER V., LICHTENEGGER K., INNERHOFER P., GERARDTS B., GÖLLES M., 2016 *Mathematische Modellierung mittlerer bis großer Solaranlagen als Basis für modellbasierte Regelungsstrategien*, Gleisdorf Solar 2016 (Auszeichnung als innovativstes Poster)

UNTERBERGER, V. & GÖLLES, M., *Challenges toward model-based control for hybrid biomass-based heating systems*, 2015, Nachhaltige Gebäude. Graz: Leykam Buchverlagsgesellschaft, Band 10. S. 393-404 (Science. Research. Pannonia).