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**Fakultät für Mathematik**  
Oskar-Morgenstern-Platz 1  
A-1090 Vienna  
Austria

<https://owos.univie.ac.at>

## ONE WORLD OPTIMIZATION SEMINAR

May 10<sup>th</sup> 2021 @ 15:30 CEST (Central European Summer Time)

**MICHAEL HINTERMÜLLER**

(Weierstrass Institute / Humboldt University of Berlin)

### **Optimization with Learning-Informed Differential Equation Constraints and Its Applications**

**Abstract.** Inspired by applications in optimal control of semilinear elliptic partial differential equations and physics-integrated imaging, differential equation constrained optimization problems with constituents that are only accessible through data-driven techniques are studied. A particular focus is on the analysis and on numerical methods for problems with machine-learned components. For a rather general context, an error analysis is provided, and particular properties resulting from artificial neural network based approximations are addressed. Moreover, for each of the two inspiring applications analytical details are presented and numerical results are provided.

*The link of the zoom-room of the meeting and the corresponding password will be announced the day before the talk on the mailing list of the seminar, to which one can subscribe on <https://owos.univie.ac.at>.*