Kris Villez

Curriculum Vitae

Current appointments

2019–Present **Sr. R&D Staff Member – Advanced Control Theory and Applications**, *ORNL (Oak Ridge National Laboratory)*, Oak Ridge, TN, USA

2021–Present **Joint Faculty – Graduate Student Advisor (courtesy appointment)**, *University of Tennessee, Bredesen Center*, Knoxville, TN, USA

Previous appointments

2017–2019 **Group Leader in Sensors and Automation (Tenured)**, *Eawag (Swiss Federal Institute of Aquatic Science and Technology)*, Dübendorf, Switzerland

2018–2019 **Lecturer**, *ETH Zürich*, Zürich, Switzerland

2012–2017 **Group Leader in Sensors and Automation (Tenure-track)**, *Eawag (Swiss Federal Institute of Aquatic Science and Technology)*, Dübendorf, Switzerland

2008–2012 **Postdoctoral Research Associate**, *Purdue University*, West Lafayette, IN, USA

2008–2008 **Postdoctoral Trainee**, *Université Laval*, Québec, QC, Canada

Education

2007 **Ph.D. in Applied Biological Sciences**, *Ghent University*, Ghent, Belgium
Multivariate and qualitative data analysis for monitoring, diagnosis and control of sequencing batch reactors for wastewater treatment

2003 **M.Sc. in Bio-Engineering**, *Ghent University*, Ghent, Belgium
Simulation and experimental study of the SHARON process for coupling with an Anammox unit

2000 **B.Sc. in Bio-Engineering**, *Ghent University*, Ghent, Belgium

Awards and recognition (2015–present)

2019 **Plenary Talk**, *10th IWA Symposium on Systems Analysis and Integrated Assessment (Watermatex2019) – Engineering during times of creative chaos: Avoiding pitfalls for machine learning in the water sector*

2016 **IWA Fellow**, *International Water Association, Nominated for the period 2016–2020*

2016 **Conference Chair**, *Elected to organize the 2nd IWA/WEF Water Resource Recovery Modelling Seminar (WRRmod2020)*

2015 **Program Award**, *Best oral presentation at the 9th IWA Symposium on Systems Analysis and Integrated Assessment (Watermatex2015)*

▬▬▬ Awarded projects (2018–present)

2022–2023 **CFTF23**, *Carbon Fiber Technology Facility - Annual Operating Plan Fiscal Year 2023*
Co-Principal Investigator; Funding: Department of Energy, USA; budget undisclosed

2022–2025 **Biomaterials 3**, *Biomaterials Research Phase 3 (Collaboration ORNL/UMaine)*
Co-Principal Investigator; Funding: Department of Energy, USA; budget undisclosed

2022–2025 **Advanced Process Controls**, *Autonomous Control and Optimization for Direct-to-Potable Reuse*
Principal Investigator; Funding: National Alliance for Water Innovation, USA; 1.9M USD

2022–2024 **Process Twins**, *Process Twins for Decision-Support and Dynamic Energy/Cost Prediction in Water Reuse Processes*
Co-Principal Investigator; Funding: National Alliance for Water Innovation, USA; 1M USD

2021–2022 **CFTF22**, *Carbon Fiber Technology Facility - Annual Operating Plan Fiscal Year 2022*
Co-Principal Investigator; Funding: Department of Energy, USA; budget undisclosed

2021–2024 **Crossing the Finish Line**, *Integration of Data-Driven Process Control for Maximization of Energy and Resource Efficiency in Advanced Water Resource Recovery Facilities*
Co-Principal Investigator; Funding: Department of Energy, USA; 2.2M USD

2020–2021 **CFTF21**, *Carbon Fiber Technology Facility - Annual Operating Plan Fiscal Year 2021*
Co-Principal Investigator; Funding: Department of Energy, USA; budget undisclosed

2020–2021 **Foundational Controls**, *Foundational control methods for water treatment systems*
Principal Investigator; Funding: National Alliance for Water Innovation, USA; 500'000 USD

2020–2021 **Biomaterials 2**, *Biomaterials Research Phase 2 (Collaboration ORNL/UMaine)*
Co-Principal Investigator; Funding: Department of Energy, USA; budget undisclosed

2019–2022 **MetaCO**, *Task group on meta-data collection and organization in wastewater treatment and wastewater resource recovery systems*
Coordinator; Funding: International Water Association, The Netherlands; 7'500 CHF

2018–2020 **ADASen**, *Anomaly detection for adaptive sensor management*
Principal Investigator; Funding: Eawag, Switzerland; 276'000 CHF

2018–2019 **OptProRheno2018**, *Optimal operation of the Basel drainage network and wastewater treatment plant*
Co-Principal Investigator; Funding: ProRheno, Switzerland; 60'000 CHF

▬▬▬ Supervision (2015–present)

Postdoc **Dhrubajit Chowdhury**, *PI, 2020–2022*
Monique McClain, *PI, 2020–2021*
Stefania Russo, *PI, 2018–2020*
Alma Masic, *PI, 2013–2016*

Ph.D. **Christopher O'Brien**, *PI, 2022–present*

Jay Pike, *PI, 2021–present*

Christoph S. Metzner, *PI, 2020–2020*

Mariane Y. Schneider, *co-PI, 2016–2020*

Christian Thürlimann, *PI, 2015–2019*

M.Sc. **Dissertations (PI): 9**, *Xierzhati Aniwa, Annina Brupbacher, Elisabeth Grimon, Wenjin Hao, Angelika Hess, Guangyu Li, Benjamin Stucki, Urs Schönenberger, Christian Züger*

Dissertations (co-PI): 6, *Viviane Furrer, Gabriel Kämpf, Simon Kramer, Arnold Mauchle, Rasmus Noerregård, Eleonora Sprenger*

Projects: 2, *Katja Briner, Qie Wu*

B.Sc. **Projects: 2**, *Simon Kramer, Martin Vogt*

Assistant **Simon Kramer**, *PI, 2018*

Kito Ohmura, *PI, 2017–2018*

Teaching (2015-present)

University lectures

2018 **Systems analysis and mathematical modeling in urban water management**, Lectures: 14h, People: 40, ETHZ, Switzerland

2017 **Workshop principal component analysis**, Lectures: 2h, People: 20, ICRA: Catalan Institute for Water Research, Spain – European Industrial Doctorate (EID) project Treatrec – Advanced Technology Course 4

In-house workshops

2019 **Anomaly detection in sensor networks workshop**, Lectures: 5h, People: 15

2019 **Workshop regression with high-dimensional inputs**, Lectures: 8h, People: 20

2018 **Workshop process data analytics**, Lectures: 6h, People: 15

2017 **Workshop principal component analysis**, Lectures: 8h, People: 12

2016 **Workshop principal component analysis**, Lectures: 4h, People: 8

Received training

2018 **Project management**, *Methodology & Tools*, BWI Management

Workshop for PhD supervisors, *My role and responsibilities - giving feedback and addressing dysfunctions*, Toivanen

PLC programming, WAGO

2016 **Leadership workshop**, *Team management*, Eawag, Switzerland

2010 **Preparing Future Faculty**, *Developing skills for a successful academic career*, Purdue University, USA

2010 **College teaching workshops II**, *Expanding and application of educational skills*, Purdue University, USA

2009 **College teaching workshops I**, *Adoption and application of basic teaching skills*, Purdue University, USA

Leadership & community

PhD committee member (2018-present)

current	**Alexandria Gagon**, *Model-based control of full-scale wastewater treatment plants*, Virigina Tech, VA, USA
current	**Sophie Guillaume**, *Model hybridization for reliable decision-making*, INRA, France
2020	**Pezhman Kazemi**, *Data-driven soft-sensors for monitoring and fault diagnosis in wastewater treatment plants*, PhD thesis, Universitat Rovira i Virgili, Spain
2020	**Mariane Y. Schneider**, *Quantifying the performance of on-site wastewater treatment systems with soft-sensing*, PhD thesis, ETH Zürich, Department of Civil, Environmental and Geomatic Engineering, Switzerland
2019	**Christian Thürlimann**, *Soft-sensing, automation, and diagnosis for nitrification*, PhD thesis, ETH Zürich, Department of Civil, Environmental and Geomatic Engineering, Switzerland

Management (2018-present)

2017–2022	**International Water Association (IWA) – Instrumentation Control and Automation Specialist Group (ICA)**, *Vice-Chair*
2016–2020	**International Water Association (IWA)**, *IWA Fellow*
2014–2019	**Verband Schweizer Abwasser- und Gewässerschutzfachleute (VSA, Swiss Water Association) – Ordner Messtechnik in der Siedlungsentwšserung (Handbook instrumentation in urban water drainage)**, *Committee member, Contributor*
2015–2018	**International Water Association (IWA) – Modelling and Integrated Assessment Specialist Group (MIA)**, *Liaison Officer*

Membership

IWA	**International Water Association**, *2004–2009, 2012–present*
iEMSs	**International Environmental Modelling & Software Society**, *2006–present*

Organization of international conferences, symposia, and workshops (2018-present)

Chair	**WRRmod2021**, *7th IWA/WEF Water Resource Recovery Modelling Seminar*
Scientific committee	**Watermatex2019**, *10th IWA Symposium on Modelling and Integrated Assessment*
	WRRmod2018, *1st IWA/WEF Wastewater Resource Recovery Modelling Seminar*
Organizing committee	**WRRmod2022+**, *8th IWA/WEF Water Resource Recovery Modelling Seminar*
	CAPS2014/2018, *2nd/4th Informal workshop on Chemometrics for Aquatic Processes and Systems*
Workshop organizer	**WWCE2018**, *Principles of Data Management - How Collected Data Can Be Useful and Reliable*, IWA World Water Congress & Exhibition 2018
	WWCE2018, *Principles of Online Data Validation - An introduction*, IWA World Water Congress & Exhibition 2018
Reviewer	**RW2023**, *Resilience Week 2023*

RW2022, *Resilience Week 2022*

RW2021, *Resilience Week 2021*

DYCOPS2019, *12th IFAC Symposium on Dynamics and Control of Process Systems, including Biosystems*

Institutional service (2018-present)

2018–2019	**DataScience@Eawag Seminar Series**
2018–2019	**Department head deputy**

Peer review of scientific proposals

2022	**Massachusetts Institute of Technology**, *USA*
2018	**University of Wisconsin-Milwaukee (UWM) Research Foundation**, *USA*
2016	**Vinnova**, *Sweden*
2015	**European Cooperation in Science and Technology (COST)**, *European Union*
2012	**Industrieel Onderzoeksfonds (IOF, Industrial Research Fund)**, *Flanders, Belgium*

Peer review of books

2018	**Cambridge University Press**, *India*

Peer review of articles (numbers per journal, 2018–present)

15	Water Science and Technology
13	Water Research
5	Environmental Science & Technology
4	Industrial & Engineering Chemistry Research; Journal of Process Control
3	Environmental Science: Water Research & Technology; Water Practice and Technology
2	Computers and Chemical Engineering; Control Engineering Practice
1	Analytical and Bioanalytical Chemistry; Applied Sciences; Environmental Earth Sciences; IEEE Transactions on Automation Science and Engineering; Mathematical and Computer Modelling of Dynamical Systems; Processes; Sensors

Additional skills

Languages

Native	Dutch	
Advanced	English	*Conversationally fluent, near perfect writing*
Intermediate	German	*Conversationally fluent, intermediate writing skills*
	French	*Conversationally fluent, basic writing skills*

Computation & IT

Expert	Matlab, Octave, Python
Proficient	Git, Grafana, NodeRed, PostgreSQL, SIMBA#, SUMO, WEST
Skilled	Berkeley Madonna, C, LabView, R