

# FRANZ SCHUG

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## Professional Experience

- since 03/2018 **Humboldt-Universität zu Berlin, Geomatics Lab** Doctoral Researcher  
Rudower Chaussee 16, 12489 Berlin, Germany  
**Project:** Understanding the Role of Material Stock Patterns for the Transformation to a Sustainable Society (MAT\_STOCKS)
- 07/2017 – 08/2017 **Humboldt-Innovation GmbH** Student Research assistant  
Rudower Chaussee 16, 12489 Berlin, Germany
- 10/2016 – 12/2016 **botanicly** Intern  
Luisenstraße 53, 101117 Berlin, Germany
- 07/2013 – 09/2015 **Humboldt-Universität zu Berlin, Geomatics Lab** Student research assistant  
Rudower Chaussee 16, 12489 Berlin, Germany
- 03/2014 – 05/2014 **GFZ German Research Centre for Geosciences** Intern  
Telegrafenberg, 14473 Potsdam, Germany
- 02/2013 **U.S. National Park Service at Carlsbad Caverns National Park** Volunteer  
3225 National Parks Highway, Carlsbad, New Mexico 88220, USA
- 02/2011 – 05/2011 **REHAU Services S.à.r.l., Department of H.R.** Intern  
2 rue Robert Schuman, 57340 Morhange, France

## Education

- 10/2014 – 07/2017 **M.Sc. Physical Geography, Humboldt-Universität zu Berlin**, Germany
- 09/2015 – 04/2016 **Visiting Student, Simon Fraser University**, Burnaby, BC, Canada
- 10/2011 – 09/2014 **B.Sc. Geography & Computer Sciences, Humboldt-Universität zu Berlin**, Germany
- 09/2008 - 08/2011 **B.A. Business Administration, U of Applied Sciences Saarbrücken**, Germany  
and **U Paul Verlaine de Metz**, France

## Scholarships / awards

- 2019 **European Commission Student Grant** for attending ESA Living Planet Symposium
- 2015 **IEEE Travel Grant** for attending IEEE Intl. Geosci. and Remote Sensing Sympos.
- 2015 **IRI THESys award** - best Thesis in human- environment research
- 2014 **Best graduate** Bachelor of Science 2014 in Geography at Humboldt-Universität zu Berlin
- 2014 – 2016 Scholarship (**Deutschlandstipendium**) granted by Stiftung Humboldt-Universität and the German Federal Ministry of Education and Research for student research in sustainability and global justice

## Teaching

2020: Research Seminar *Remote Sensing for Settlement Mapping* / 28 hrs / B.A. & M.A.

## Publications

### peer-reviewed articles

**Schug, F.**; Frantz, D.; van der Linden, S.; Hostert, P. (2021): *Gridded population mapping for Germany based on building density, height and type from Earth Observation data using census disaggregation and bottom-up estimates*. PLOS ONE, 16(3). doi: 10.1371/journal.pone.0249044

Haberl, H.; Wiedenhofer, D.; **Schug, F.**; Frantz, D.; Virág, D.; Plutzer, C.; Gruhler, K.; Lederer, J.; Schiller, G.; Fishman, T.; Lanau, M.; Gattringer, A.; Kemper, T.; Liu, G.; Tanikawa, H.; van der Linden, S.; Hostert, P (2021): *High-Resolution Maps of Material Stocks in Buildings and Infrastructures in Austria and Germany*. Environmental Science & Technology, doi: 10.1021/acs.est.0c05642

Frantz, D.; **Schug, F.**; Okujeni, A.; Navacchi, C.; Wagner, W.; van der Linden, S.; Hostert, P. (2021): *National-scale mapping of building height using Sentinel-1 and Sentinel-2 time series*. Remote Sensing of Environment, vol. 252. doi: 10.1016/j.rse.2020.112128

Wellmann, T.; Lausch, A.; Andersson, E.; Knapp, S.; Cortinovis, C.; Jache, J.; Scheuer, S.; Kremer, P.; Mascarenhas, A.; Kraemer, R.; Haase, A.; **Schug, F.**; Haase, D. (2020): *Remote Sensing in urban planning: Contributions towards ecologically sound policies?* Landscape and Urban Planning, vol. 204. doi: <https://doi.org/10.1016/j.landurbplan.2020.103921>

**Schug, F.**; Frantz, D.; Okujeni, A.; van der Linden, S.; Hostert, P. (2020). *Mapping urban-rural gradients of settlements and vegetation at national scale using Sentinel-2 spectral-temporal metrics and regression-based unmixing with synthetic training data*. Remote Sensing of Environment, vol. 246, September 2020, doi: 10.1016/j.rse.2020.111810

Wellmann, T.; **Schug, F.**; Haase, D.; Pflugmacher, D.; van der Linden, S. (2020). *Green growth? On the relation between population density, land use and vegetation cover fractions in a city using a 30-years Landsat time series*. Landscape and Urban Planning, vol. 202. doi: 10.1016/j.landurbplan.2020.103857

**Schug, F.**; Okujeni, A.; Hauer, J.; Hostert, P.; Nielsen, J. Ø.; van der Linden, S. (2018). *Mapping patterns of urban development in Ouagadougou, Burkina Faso, using machine learning regression modeling with bi-seasonal Landsat time series*. Remote Sensing of Environment, vol. 210, June 2018, doi: 10.1016/j.rse.2018.03.022

### conference contributions (first author only)

**Schug, F.**; Frantz, D.; Okujeni, A.; van der Linden, S.; Hostert, P (2019): *Mapping Settlement And Vegetation Continuous Fields At National Scale In A Temperate Environment Using Sentinel-2*. **Oral** contribution. EARSeL Joint Workshop 2020, Liège, 30 March – 01 April 2021

**Schug, F.**; Frantz, D.; Okujeni, A.; van der Linden, S.; Hostert, P (2019): *Sentinel-2 and machine learning regression for built-up and urban green fraction mapping across European settlements*. **Oral** contribution. ESA Living Planet Symposium, Milan, 13 – 17 May 2019

**Schug, F.**; Frantz, D.; Okujeni, A.; van der Linden, S.; Hostert, P (2019): *Urban surface fraction mapping with optical remote sensing for material stock estimation*. **Oral** contribution. Global Land Programme Open Science Meeting, Bern, 24 – 26 April 2019

**Schug, F.**; van der Linden, S.; Okujeni, A.; Hostert, P (2019): *Using Time Series Information For Mapping Human Settlements With Sentinel-2*. **Oral** contribution. DGPF Dreiländertagung, Vienna, 20 – 21 February 2019

**Schug, F.**; van der Linden, S.; Okujeni, A.; Hostert, P (2018): *Evaluating Sentinel-2 imagery for mapping human settlements*. **Oral** contribution. ESA Mapping Urban Areas From Space, Frascati, 30 – 31 October 2018

**Schug, F.**; Okujeni, A.; Hauer, J.; Hostert, P.; Nielsen, J. Ø; van der Linden, S. (2018). *Mapping Patterns Of Urban Development Using Support Vector Regression With Synthetically Mixed Training Spectra And Bi-seasonal Landsat Time Series*. **Poster** contribution. EARSeL 5<sup>th</sup> Joint Workshop “Urban Remote Sensing – Challenges and Solutions”, Bochum, 24 – 26 September 2018

**Schug, F.**; Pagalan, L.; Mather, S. (2015): *Modeling population growth of young adults within the City of Vancouver using Cellular Automata*. **Poster** contribution. ESRI User Conference, Vancouver, November 2015

**Schug, F.**; van der Linden, S.; Nielsen, J. Ø; Okujeni, A. (2015): *Multi-seasonal spectral mixture analysis using Landsat data for mapping urban land cover in Ouagadougou, Burkina Faso*. **Oral** contribution. IEEE International Geoscience and Remote Sensing Symposium, Milan, 26 – 31 July 2015

#### **other**

van der Linden, S.; Kuemmerle, T.; Janson, K.; **Schug, F.** (Eds., 2014). Conference proceedings: *Frontiers in Earth Observation for Land System Science*. 5<sup>th</sup> Workshop of the EARSeL Special Interest Group on Land Use and Land Cover, Berlin, 17 – 18 March 2014

#### **supervised theses**

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|------|---|
| 2019 | <i>Cremer, N.</i> : Regression-based impervious surface mapping across European capital cities using semi-automated training data collection  |
| 2019 | <i>Küpper, J.</i> : Dhaka revisited - Combining Sentinel-1 and Sentinel-2 Imagery for Land Cover Mapping in a Monsoon Region  |
| 2018 | <i>Spengler, S.</i> : Mapping urban structures from Sentinel-2 data for Ouagadougou, Burkina Faso   |
| 2018 | <i>Will, C.</i> : Eine Untersuchung der zeitlichen Übertragbarkeit fernerkundlicher Klassifikationsmodelle zur urbanen Landnutzungskartierung in Berlin auf Basis einer Landsat-Zeitreihe |

#### **reviewing activities**

Science of the Total Environment, Elsevier  
International Journal of Remote Sensing, T & F  
GIScience & Remote Sensing, T & F  
Remote Sensing, MDPI