Dr. Guido Kraemer

Personal Information

Address	Petersstr. 46 – 04109 Leipzig – Germany
Phone	+49 1577 609 94 39
Email	guido.kraemer@uni-leipzig.de
Date of birth	14/03/1985

Professional Experience

2019–present **Scientist**, *W1, Institute for Geology and Geophysics, Remote Sensing Centre for Earth System Research, Leipzig University*

Education

2021–2023 **Zertifikat Lehre, Module 1-3**, *Hochschuldidaktisches Zentrum Sachsen*, 240 Credits

2015–2019 **PhD**, *Universitat de València/Max Planck Institute for Biogeochemisty*, Grade: outstanding
Remote Sensing

2013–2015 **M.Sc.**, *Friedrich-Schiller-Universität*, Jena, Grade: 1.6
Ecology, Evolution, and Systematics

2008–2012 **B.Sc./Ing.**, *Universidad Nacional de la Amazonía Peruana*, Iquitos, Grade: 14.88/20
Tropical Rainforest Ecology

2005–2008 **Undergrad studies**, *Ludwig-Maximilians-Universität*, München
Mathematics

Awards

2019 Human Development Challenge — Special mention "for highly-complex visualization of 621 variables from the World Development Indicators (WDI) database"
`https://www.bgc-jena.mpg.de/~gkraemer/hdi_vis`

Language

German	Native
English	C2
Spanish	C2

Computer Skills

OS	Linux, Windows, TrueNAS	Office	LaTeX, MS Office, Libre Office
Programming	High Performance R, Julia, Python, C, Typescript	Computing	HPC Cluster, Blockchain, Docker

Teaching Experience

Summer term 2023	**12-GEO-M-DS02: Spatio-temporal Data**, *RSC4Earth*, Universität Leipzig
Summer term 2023	**12-GGR-M-GFP2: Geoinformationssysteme - Modelle und Analysen**, *Institut für Geographie*, Universität Leipzig
Winter term 2022/23	**12-GEO-M-SK01: Research Data Management**, *RSC4Earth*, Universität Leipzig
Summer term 2022	**12-GGR-M-GFP2: Geoinformationssysteme - Modelle und Analysen**, *Institut für Geographie*, Universität Leipzig
Summer term 2022	**12-GGR-M-GFA1: Geodatenanalyse in der Wirtschafts- und Sozialgeographie**, *Institut für Geographie*, Universität Leipzig
Winter term 2021/22	**12-GGR-M-AG12: Seminar Multivariate Statistik**, *Institut für Geographie*, Universität Leipzig
Winter term 2021/22	**12-GGR-B-02: Einführung in die Programmierung mit R.**, *Institut für Geographie*, Universität Leipzig
Summer term 2021	**12-GGR-M-GFP2: Geoinformationssysteme - Modelle und Analysen**, *Institut für Geographie*, Universität Leipzig
Summer term 2021	**12-GGR-M-GFA1: Geodatenanalyse in der Wirtschafts- und Sozialgeographie**, *Institut für Geographie*, Universität Leipzig
Winter term 2020/2021	**12-GGR-M-AG12: Seminar Multivariate Statistik**, *Institut für Geographie*, Universität Leipzig
Winter term 2020/2021	**12-GGR-B-02: Einführung in die Programmierung mit R**, *Institut für Geographie*, Universität Leipzig
Summer term 2020	**12-GGR-M-GFA1: Geodatenanalyse in der Wirtschafts- und Sozialgeographie**, *Institut für Geographie*, Universität Leipzig
Mar 2020	**NERC Big Data Course**, *Department for Continuing Education*, Oxford `https://web.archive.org/web/20210303213526/https://www.conted.ox.ac.uk/events/view/big-data-in-environmental-biology`
Feb 2018	**NERC Big Data Course**, *Department for Continuing Education*, Oxford `https://web.archive.org/web/20171215114313/https://www.conted.ox.ac.uk/events/view/big-data-in-environmental-biology`
January 2018	**Advances Statistics & Data Analysis**, *Max Planck Institute for Biogeochemistry*, Jena
August 2017	**Exploring the Earth system with data and models**, *Summer Akademy NAka*, Papenburg `https://jgw-ev.de/nachhaltigkeitsakademie/naka-2017/kurs-1-daten-modelle/`
May 2017	**R Course: The Basics**, *Max Planck Institute for Biogeochemistry*, Jena
April 2016	**R Course: The Basics**, *Max Planck Institute for Biogeochemistry*, Jena

Third-Party Funding

DeepESDL	European Space Agency, day-to-day supervision
COCAP	HGF, day-to-day supervision
Social Data Cube	NDFI4Earth Pilot

Software

dimRed	Dimensionality Reduction in R, `https://github.com/gdkrmr/dimRed`
coRanking	The CoRanking matrix in R, `https://github.com/gdkrmr/coRanking`
DRR	Dimensionality Reduction via Regression in R, `https://github.com/gdkrmr/DRR`
WeightedOnlineStats.jl	Statistics for big data with $\mathcal{O}(1)$ memory in pure Julia, `https://github.com/gdkrmr/WeightedOnlineStats.jl`

BTCParser.jl	Parsing the Bitcoin blockchain in pure Julia, `https://github.com/gdkrmr/BTCParser.jl`
LevelDB.jl	LevelDB wrapper for Julia, `https://github.com/gdkrmr/LevelDB.jl`
Ripemd.jl	Ripemd hashing in pure Julia, `https://github.com/gdkrmr/Ripemd.jl`
Base58.jl	Base58 encoding in pure Julia, `https://github.com/gdkrmr/Base58.jl`

References

Prof. Dr. Miguel Mahecha	Professor and head of the Earth System Data Science group *RSC4Earth* at Leipzig University. miguel.mahecha@uni-leipzig.de
Prof. Dr. Markus Reichstein	Director of the department for *Biogeochemical Integration* of the Max Planck Institute for Biogeochemistry, Jena. mreichstein@bgc-jena.mpg.de
Prof. Dr. Gustau Camps-Valls	Professor at *Image Processing Lab*, Universitat de València. gustau.camps@uv.es

Publications

[1] Joswig, J. S., Kattge, J., **Kraemer, G.**, Mahecha, M. D., Rüger, N., Schaepman, M. E., Schrodt, F., Schuman, M. C., "Imputing Missing Data in Plant Traits: A Guide to Improve Gap-Filling". In: *Global Ecology and Biogeography* n/a.n/a (May 2023). ISSN: 1466-8238. DOI: 10.1111/geb.13695. (Visited on 06/09/2023).

[2] Pacheco-Labrador, J., Migliavacca, M., Ma, X., Mahecha, M., Carvalhais, N., Weber, U., Benavides, R., Bouriaud, O., Barnoaiea, I., Coomes, D. A., Bohn, F. J., **Kraemer, G.**, Heiden, U., Huth, A., Wirth, C., "Challenging the Link between Functional and Spectral Diversity with Radiative Transfer Modeling and Data". In: *Remote Sensing of Environment* 280 (Oct. 2022), p. 113170. ISSN: 0034-4257. DOI: 10.1016/j.rse.2022.113170.

[3] Pacheco-Labrador, J., Weber, U., Ma, X., Mahecha, M. D., Carvalhais, N., Wirth, C., Huth, A., Bohn, F. J., **Kraemer, G.**, Heiden, U., FunDivEUROPE members, Migliavacca, M., "Evaluating the potential of DESIS to infer plant taxonomical and functional diversities in European forests". In: *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. Vol. XLVI-1-W1-2021. Copernicus GmbH, Feb. 2022, pp. 49–55. DOI: 10.5194/isprs-archives-XLVI-1-W1-2021-49-2022.

[4] Migliavacca, M., Musavi, T., Mahecha, M. D., Nelson, J. A., Knauer, J., Baldocchi, D. D., Perez-Priego, O., Christiansen, R., Peters, J., Anderson, K., Bahn, M., Black, T. A., Blanken, P. D., Bonal, D., Buchmann, N., Caldararu, S., Carrara, A., Carvalhais, N., Cescatti, A., Chen, J., Cleverly, J., Cremonese, E., Desai, A. R., El-Madany, T. S., Farella, M. M., Fernández-Martínez, M., Filippa, G., Forkel, M., Galvagno, M., Gomarasca, U., Gough, C. M., Göckede, M., Ibrom, A., Ikawa, H., Janssens, I. A., Jung, M., Kattge, J., Keenan, T. F., Knohl, A., Kobayashi, H., **Kraemer, G.**, Law, B. E., Liddell, M. J., Ma, X., Mammarella, I., Martini, D., Macfarlane, C., Matteucci, G., Montagnani, L., Pabon-Moreno, D. E., Panigada, C., Papale, D., Pendall, E., Penuelas, J., Phillips, R. P., Reich, P. B., Rossini, M., Rotenberg, E., Scott, R. L., Stahl, C., Weber, U., Wohlfahrt, G., Wolf, S., Wright, I. J., Yakir, D., Zaehle, S., Reichstein, M., "The Three Major Axes of Terrestrial Ecosystem Function". In: *Nature* (Sept. 2021), pp. 1–5. ISSN: 1476-4687. DOI: 10.1038/s41586-021-03939-9.

[5] Mahecha, M. D., Rzanny, M., **Kraemer, G.**, Mäder, P., Seeland, M., Wäldchen, J., "Crowd-Sourced Plant Occurrence Data Provide a Reliable Description of Macroecological Gradients". In: *Ecography* 44 (2021). ISSN: 1600-0587. DOI: 10.1111/ecog.05492.

[6] Krich, C., Migliavacca, M., Miralles, D. G., **Kraemer, G.**, El-Madany, T. S., Reichstein, M., Runge, J., Mahecha, M. D., "Functional Convergence of Biosphere–Atmosphere Interactions in Response to Meteorological Conditions". In: *Biogeosciences* 18.7 (2021), pp. 2379–2404. ISSN: 1726-4170. DOI: 10.5194/bg-18-2379-2021.

[7] **Kraemer, G.** "Low-Dimensional Representations of Earth System Processes". Doctorado En Teledetección. Valencia: Universitat de València, 2020.

[8] **Kraemer, G.**, Reichstein, M., Camps-Valls, G., Smits, J., Mahecha, M. D., "The Low Dimensionality of Development". In: *Social Indicators Research* (2020). ISSN: 1573-0921. DOI: 10.1007/s11205-020-02349-0.

[9] **Kraemer, G.**, Camps-Valls, G., Reichstein, M., Mahecha, M. D., "Summarizing the State of the Terrestrial Biosphere in Few Dimensions". In: *Biogeosciences* 17.9 (2020), pp. 2397–2424. ISSN: 1726-4170. DOI: 10.5194/bg-17-2397-2020.

[10] Mahecha, M. D., Guha-Sapir, D., Smits, J., Gans, F., **Kraemer, G.,** "Chapter 13 - Data Challenges Limit Our Global Understanding of Humanitarian Disasters Triggered by Climate Extremes". In: *Climate Extremes and Their Implications for Impact and Risk Assessment.* Ed. by Jana Sillmann, Sebastian Sippel, and Simone Russo. Elsevier, 2020, pp. 243–256. ISBN: 978-0-12-814895-2. DOI: 10.1016/B978-0-12-814895-2.00013-6.

[11] Mahecha, M. D., Gans, F., Brandt, G., Christiansen, R., Cornell, S. E., Fomferra, N., **Kraemer, G.**, Peters, J., Bodesheim, P., Camps-Valls, G., Donges, J. F., Dorigo, W., Estupinan-Suarez, L. M., Gutierrez-Velez, V. H., Gutwin, M., Jung, M., Londoño, M. C., Miralles, D. G., Papastefanou, P., Reichstein, M., "Earth System Data Cubes Unravel Global Multivariate Dynamics". In: *Earth System Dynamics* 11.1 (2020), pp. 201–234. ISSN: 2190-4979. DOI: 10.5194/esd-11-201-2020.

[12] **Kraemer, G.**, Reichstein, M., Mahecha, M. D., "dimRed and coRanking – Unifying Dimensionality Reduction in R". In: *The R Journal* 10.1 (2018), pp. 342–358. DOI: 10.32614/RJ-2018-039.

[13] Sierra, C. A., Mahecha, M., Poveda, G., Álvarez-Dávila, E., Gutierrez-Velez, V. H., Reu, B., Feilhauer, H., Anáya, J., Armenteras, D., Benavides, A. M., Buendia, C., Duque, Á., Estupiñan-Suarez, L. M., González, C., Gonzalez-Caro, S., Jimenez, R., **Kraemer, G.**, Londoño, M. C., Orrego, S. A., Posada, J. M., Ruiz-Carrascal, D., Skowronek, S., "Monitoring Ecological Change during Rapid Socio-Economic and Political Transitions: Colombian Ecosystems in the Post-Conflict Era". In: *Environmental Science & Policy* 76 (2017), pp. 40–49. DOI: 10.1016/j.envsci.2017.06.011.

[14] **Kraemer, G.** "Drivers of Diversity and Functional Characteristics in Broadleaf Forests – the Example of Thuringia". Master of Science in Evolution, Ecology and Systematics. Jena: Universität Jena, 2015.

[15] **Kraemer, G.** "Aplicación de una metodología basada en el análisis compuesto para predecir niveles de crecientes y estiajes en la cuenca del río Mazán, Loreto - Perú." Ing. en Ecología de Bosques Tropicales. Iquitos: Universidad Nacional de la Amazonía Peruana, 2013. URL: https://repositorio.unapiquitos.edu.pe/handle/20.500.12737/2496.

[16] Muhr, J., Angert, A., Negrón-Juárez, R. I., Muñoz, W. A., **Kraemer, G.**, Chambers, J. Q., Trumbore, S. E., "Carbon Dioxide Emitted from Live Stems of Tropical Trees Is Several Years Old". In: *Tree Physiology* 33.7 (2013), pp. 743–752. DOI: 10.1093/treephys/tpt049.

[17] Angert, J., Negron Juarez, R., Alegria Muñoz, W., **Kraemer, G.**, Ramirez Santillan, J., Chambers, J. Q., Trumbore, S. E., "The Contribution of Respiration in Tree Stems to the Dole Effect". In: *Biogeosciences* 9.10 (2012), pp. 4037–4044. DOI: 10.5194/bg-9-4037-2012.

[18] Angert, A., Muhr, J., Negron Juarez, R., Alegria Muñoz, W., **Kraemer, G.**, Ramirez Santillan, J., Barkan, E., Mazeh, S., Chambers, J. Q., Trumbore, S. E., "Internal Respiration of Amazon Tree Stems Greatly Exceeds External CO2 Efflux". In: *Biogeosciences* 9.12 (2012), pp. 4979–4991. DOI: 10.5194/bg-9-4979-2012.

Petersstr. 46 – 04109, Leipzig – Germany
+49 1577 609 94 39 • *guido.kraemer@uni-leipzig.de* • *gdkrmr*
guido-kraemer.com