Dr. Guido Kraemer

Personal Information

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Professional Experience

2019–present **Post Doctoral Scientist**, *Universität Leipzig*

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
Ecología de Bosques Tropicales

2005–2008 **No degree**, *Ludwig-Maximilians-Universität*, München
Mathematics

Teaching

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

Language

German	Native	
English	C2	*Science*
Spanish	C2	*Studies in Peru/PhD in Valencia*

Computer Skills

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

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. 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

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`

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.

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[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.

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