

Pablo S. C. Santos

Curriculum Vitae

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Last Updated: April 22, 2026

Computational Biologist with expertise in Molecular Pathology, Immunogenetics, Ecology, Data Science and Statistics. PhD in Human Genetics. Enthusiastic for Teaching and Open Data/Source/Science.

Education

2010 **Ph.D. in Human Genetics**, *Freie Universität Berlin and Charité Universitätsmedizin Berlin, Germany*

Dissertation: Linkage Disequilibrium and Transmission Distortion Affecting Human Chromosome 6p (<https://refubium.fu-berlin.de/handle/fub188/9777>)

Honors: Magna Cum Laude

2005 **Bachelor of Science in Genetics and Teacher's Certification**, *Universidade Federal do Paraná, Curitiba, Brazil*

Thesis: Linkage Disequilibrium and MHC Haplotype Frequencies of 17,000 Stem Cell Donors from Curitiba/PR

Grade: 100/100

Experience

2022–
Present **Global and Planetary Health Group, Institute for Medical Epidemiology, Biometrics and Informatics, Medicine Department of the Martin Luther University of Halle-Wittenberg, Halle (Saale), Germany**, Senior Bioinformatician and Data Scientist

Here I provide expertise in Bioinformatics, Data Science and Statistics by supervising MD and PhD projects in a team of medical doctors, epidemiologists, statisticians and social scientists. We aim at understanding cancer and improving preventive health care in the context of international collaboration.

2022–
Present **CQ Beratung+Bildung GmbH, Vocational School in Berlin, Germany**, Instructor
Here I teach Bioinformatics online in a regular basis to a group of 14 to 16 students.

2020–2021 **PathoNext GmbH, Leipzig, Germany**, Senior Bioinformatician and Head of NGS Laboratory (Technischer Leiter)

After working for 5 months as a Senior Bioinformatician, I assumed the full leadership of the NGS laboratory and the bioinformatics section of the company. I headed a highly motivated and international group of scientists and technical assistants providing sequencing services on the fields of Molecular Pathology and Oncology. My team and I established new products and improved compliance and quality management systems.

- 2020 **IAV GmbH, Gifhorn, Germany**, Data Scientist and Development Engineer
After years in academia, this was my first leap into the private sector. Here I worked with an interdisciplinary team of data scientists developing products for the medical sector and applying data-driven methods into innovative industrial fields.
- 2014–2019 **Institute of Evolutionary Ecology and Conservation Genomics, University of Ulm, Germany**, Professor Assistant and Postdoc Scientist
Here I worked for 6 years as a computational and evolutionary biologist with focus on data analysis and bioinformatics. Apart from teaching (Bioinformatics, Genetics, Statistics, Ecology and Zoology), I have supervised and researched on projects tackling genomics, evolutionary ecology, disease transmission models and next-generation DNA sequencing. Data analysis and data-mining were among my primary methods, using tools such as Python (**pandas**, **scikit-learn**, **seaborn**, **requests**, **jupyter notebooks** and others), R (**ggplot2**, **lme4**, **glmer** and others) and Git/GitLab/GitHub.
- 2012–2013 **Immunogenetics and Histocompatibility Laboratory, UFPR University, Curitiba, Brazil**, Scientific Coordinator
Here I worked as a lecturer and scientific coordinator of a medium-sized workgroup focusing on immunogenetics, data mining, bioinformatics, organ transplant, miscarriage and cancer research. My workgroup genotyped voluntary stem cell donors for the National Bone Marrow Donor Registry.
- 2010–2012 **Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany**, Postdoc Researcher
Here I was responsible for the network project *Olfactory choice of partners – immune system, smell receptors and their adaptive importance for mammal health*. Besides of networking with multiple collaborators, my tasks included experiment design, the interpretation of large data sets, statistics, data-mining and Illumina DNA sequencing

Awards/Fellowships

- 2007–2008 NaFöG Stipend from the Senate of Berlin, now called *Elsa-Neumann-Stipend*
2006 and 2009 Ernst-von-Leyden Stipend - Berliner Krebsgesellschaft Fellowship

Publications

Articles in Peer-Reviewed Journals

- [1] Antonio Torres-Reyes, **Pablo S. C. Santos**, Yanetsy Elisa Rodríguez León, Estefanie Quispe Salas, Alessandra Gudila Rodriguez Mercado, Melvine Anyango Otieno, Elvis Ndikum Achiri, Jan W Kantelhardt, Andreas Wienke, Jan Christian Schlüter, and Eva Johanna Kantelhardt. Association between long-term, short-term spatial land surface temperature variations and health-related quality of life in lima, peru. *Int. J. Health Geogr.*, 25(1), Feb. 2026.
- [2] Eric Sven Kroeber, Tamara König, Ole Stöter, Biying Liu, Phoebe Mary Amulen, Margaret Borok, Gladys Chesumbai, Eric Chokunonga, Ima-Obong Ekanem, Mahine Ivanga, Bakarou Kamaté, William Muller, Abidemi Omonisi, Jean-Félix Peko, Mathe-wos Assefa, Furaha Serventi, Markus Wallwiener, Mazvita Muchengeti, **Pablo S. C. Santos**, Donald Maxwell Parkin, Eva Johanna Kantelhardt, and Nikolaus Christian Simon Mezger. Patient- and caregiver-reported barriers to radiotherapy for cancer in sub-saharan africa – a survey of population-based registries. *International Journal of Cancer*, (ijc.70390), Feb. 2026.
- [3] Mikiyas Amare Getu, Tesfaye Amare, Kefeng Li, Anam Mehmood, Yonas Fissha Adem,

- Pablo S. C. Santos**, and Hu Yan. Machine learning and deep learning models for predicting colorectal cancer metastases: A comprehensive review. *European Journal of Radiology Open*, 16:100747, 2026.
- [4] Sophie Sarah Rossner, Muluken Gizaw, Sefonias Getachew, Eyerusalem Getachew, Alemnew Destaw, Sarah Negash, Lena Bauer, Eva Susanne Marion Hermann, Abel Shita, Susanne Unverzagt, **Pablo S. C. Santos**, Eva Johanna Kantelhardt, and Eric Sven Kroeber. Health care professionals’ knowledge, attitude, practice, and infrastructure accessibility for e-learning in ethiopia: Cross-sectional study. *JMIR Medical Education*, 11:e65598–e65598, Sept. 2025.
 - [5] Friedemann Rabe, Sefonias Getachew, Clara Yolanda Stroetmann, Nikolaus Christian Simon Mezger, Tewodros Yalew Gebremariam, Bereket Berhane, Alex Mremi, Blandina Theophil Mmbaga, Pauline Boucheron, Valerie McCormack, **Pablo S. C. Santos**, Adamu Addissie, and Eva Johanna Kantelhardt. Time to pathologic diagnosis of suspicious breast lesions: An institution-based study in five ethiopian hospitals. *International Journal of Cancer*, 157(5):876–889, Apr. 2025.
 - [6] Nadine Müller-Klein, Alice Risely, Kerstin Wilhelm, Vanessa Riegel, Marta Manser, Tim Clutton-Brock, Luke Silver, **Pablo S. C. Santos**, Dominik W Melville, and Simone Sommer. Twenty years of tuberculosis-driven selection shaped the evolution of the meerkat major histocompatibility complex. *Nat. Ecol. Evol.*, 9(11):2161–2172, Nov. 2025.
 - [7] Tamara König, Nikolaus Mezger, Ole Stoeter, Phoebe Mary Amulen, Margaret Borok, Gladys Chesumbai, Moudiongui MBoungou Dimitry, Ima-Obong Ekanem, Adugna Fekadu, Bakarou Kamate, William Muller, Alex Alain Kabena Nzambikolo, Abidemi Omonisi, Furaha Serventi, Markus Wallwiener, Liu Biying, Donald Maxwell Parkin, **Pablo S. C. Santos**, Eva Johanna Kantelhardt, and Eric Sven Kroeber. Patient- and caregiver-reported barriers to chemotherapy in nine sub-saharan african countries – a cross-sectional survey among population-based registries. *International Journal of Cancer*, 158(10):2684–2696, 2025.
 - [8] Marcus Bauer, **Pablo S. C. Santos**, Andreas Wilfer, Eunice van den Berg, Annelie Zietsman, Martina Vetter, Sandy Kaufhold, Claudia Wickenhauser, Isabel dos Santos-Silva, Wenlong Carl Chen, Herbert Cubasch, Nivashini Murugan, Valerie McCormack, Maureen Joffe, Barbara Seliger, and Eva Kantelhardt. Hiv status alters immune cell infiltration and activation profile in women with breast cancer. *Nature Communications*, 16(1), May 2025.
 - [9] Meron Yohannes, Chiara Massa, Zelalem Desalegn, Kathrin Stückerath, Anja Mueller, Endale Anberber, Yonas Bekuretsion, Mathewos Assefa, **Pablo S. C. Santos**, Adamu Addissie, Marcus Bauer, Claudia Wickenhauser, Lesley Taylor, Martina Vetter, Eva Johanna Kantelhardt, Tamrat Abebe, and Barbara Seliger. Blood immune profiling of ethiopian patients with breast cancer highlights different forms of immune escape. *OncoImmunology*, 13(1), Dec. 2024.
 - [10] Meron Yohannes, Zelalem Desalegn, Marcus Bauer, Kathrin Stückerath, Endale Anberbir, Yonas Bekuretsion, Mathewos Assefa, Tariku Wakuma, Yasin Worku, **Pablo S. C. Santos**, Lesley Taylor, Adamu Adissie, Claudia Wickenhauser, Chiara Massa, Martina Vetter, Eva Johanna Kantelhardt, Barbara Seliger, and Tamrat Abebe. Immune

landscape of the tumour microenvironment in ethiopian breast cancer patients. *Breast Cancer Res.*, 26(1):162, Nov. 2024.

- [11] Clara Yolanda Stroetmann, Muluken Gizaw, Rahel Alemayehu, Abigiya Wondimagegnehu, Friedemann Rabe, **Pablo S. C. Santos**, Bariki Mchome, Blandina Theophil Mmbaga, Adamu Addissie, and Eva Johanna Kantelhardt. Adherence to Treatment and Follow-Up of Precancerous Cervical Lesions in Ethiopia. *The Oncologist*, 29(5):e655–e664, May 2024.
- [12] Nikolaus Christian Simon Mezger, Tobias Paul Seraphin, Robert Ballé, Mirko Griesel, Yvonne Walburga Joko-Fru, Lucia Hämmerl, Jana Feuchtner, Biying Liu, Annelle Zietsman, Bakarou Kamaté, Freddy Houéhanou Rodrigue Gnanngnon, Franck Gnathatin, Dimitry Moudiongui Mboungou, Mathewos Assefa, Phoebe Mary Amulen, Gladys Chesumbai, Tatenda Chingonzoh, Cesaltina Feirreira Lorenzoni, Anne Korir, **Pablo S. C. Santos**, Jörg Michael Mezger, Haifa Kathrin Al-Ali, Rafael Mikolajczyk, Donald Max Parkin, Ahmedin Jemal, and Eva Johanna Kantelhardt. Nccn guideline–concordant cancer care in sub-saharan africa: a population-based multicountry study of 5 cancers. *JNCI: Journal of the National Cancer Institute*, 117(1):120–133, Sept. 2024.
- [13] Julia Engel, Vanessa Wieder, Marcus Bauer, Sandy Kaufhold, Kathrin Stückerath, Jochen Wilke, Volker Hanf, Christoph Uleer, Tilmann Lantzsch, Susanne Peschel, Jutta John, Marleen Pöhler, Edith Weigert, Karl-Friedrich Bürrig, Jörg Buchmann, **Pablo S. C. Santos**, Eva Johanna Kantelhardt, Christoph Thomssen, and Martina Vetter. Prognostic and predictive impact of notch1 in early breast cancer. *Breast Cancer Research and Treatment*, 209(1):27–38, Aug. 2024.
- [14] Tamiru Demeke, Damen Hailemariam, **Pablo S. C. Santos**, Edom Seife, Adamu Addissie, Eric Sven Kroeber, Rafael Mikolajczyk, Birgit Silbersack, Eva Johanna Kantelhardt, and Susanne Unverzagt. Willingness and ability to pay for breast cancer treatment among patients from Addis Ababa, Ethiopia: a cross-sectional study. *PLoS One*, 19(3):e0300631, Mar. 2024.
- [15] Judith Katharina Ballé, Martina Vetter, Tariku Wakuma Kenea, Pia Eber-Schulz, Christian Reibold, Hannes-Viktor Ziegenhorn, Kathrin Stückerath, Claudia Wickenhauser, Adamu Addissie, **Pablo S. C. Santos**, Eva Johanna Kantelhardt, Sefonias Getachew, and Marcus Bauer. PAM50 breast cancer subtypes and survival of patients in rural ethiopia without adjuvant treatment: a prospective observational study. *BMC Cancer*, 24(1):1127, Sept. 2024.
- [16] Marcus Bauer, Martina Vetter, Kathrin Stückerath, Meron Yohannes, Zelalem Desalegn, Tewodros Yalew, Yonas Bekuretsion, Tariku W Kenea, Maureen Joffe and Eunice J Van Den Berg, Julien Ilunga Nikulu, Kamaté Bakarou, Shyam S Manraj, Olufemi J Ogunbiyi, Ima-Obong Ekanem, Festus Igbinoba, Mohenou Diomande, Clement Adebamowo, Charles P Dzamalala, Angelica A Anele, Annelle Zietsman, Moses Galukande, Milena Foerster, Isabel Dos-Santos-Silva, Biying Liu, **Pablo S. C. Santos**, Ahmedin Jemal, Tamrat Abebe, Claudia Wickenhauser, Barbara Seliger, Valerie McCormack, and Eva J Kantelhardt. Regional variation in the tumor microenvironment, immune escape and prognostic factors in breast cancer in sub-saharan Africa. *Cancer Immunology Research*, 11(6):720–731, Apr. 2023.
- [17] Zelalem Desalegn, Meron Yohannes, Martin Porsch, Kathrin Stückerath, Endale Anberber, **Pablo S. C. Santos**, Marcus Bauer, Adamu Addissie, Yonas Bekuretsion,

- Mathewos Assefa, Yasin Worku, Lesley Taylor, Tamrat Abebe, Eva Johanna Kannelhardt, and Martina Vetter. Intrinsic subtypes in Ethiopian breast cancer patient. *Breast Cancer Research and Treatment*, 196(3):495–504, Oct. 2022.
- [18] Paulo Milet-Pinheiro, **Pablo S. C. Santos**, Samuel Prieto-Benítez, Manfred Ayasse, and Stefan Dötterl. Differential evolutionary history in visual and olfactory floral cues of the bee-pollinated genus *Campanula* (Campanulaceae). *Plants*, 10(7), 2021.
 - [19] Mark A. F. Gillingham, B. Karina Montero, Kerstin Wihelm, Kara Grudzus, Simone Sommer, and **Pablo S. C. Santos**. A novel workflow to improve genotyping of multigene families in wildlife species: An experimental set-up with a known model system. *Molecular Ecology Resources*, 21(3):982–998, 2021.
 - [20] Marianne Volleth, Stefan Müller, Simone Sommer, and **Pablo S. C. Santos**. Cytogenetic investigations in Emballonuroidea: Extensive chromosomal reorganization characterizes the karyotype of *Saccopteryx bilineata*. *Acta Chiropterologica*, 22(1):49–55, 2020.
 - [21] Juliana S. Schauren, Ana C. M. B. G. Torres, Rodrigo C. Almeida, **Pablo S. C. Santos**, Fabiane Mulinari-Brenner, Luiz H. Lima, Luiz A. Z. Filho, Naoye Shiokawa, Maria G. Bicalho, and Mario T. Sato. Novel *CDH3* variants in Brazilian families with hypotrichosis and juvenile macular dystrophy revealed by exome sequencing. *Clinical Genetics*, 97(3):529–531, Nov. 2019.
 - [22] **Pablo S. C. Santos**, Maja Mezger, Miriam Kolar, Frank-Uwe Michler, and Simone Sommer. The best smellers make the best choosers: mate choice is affected by female chemosensory receptor gene diversity in a mammal. *Proceedings of the Royal Society B: Biological Sciences*, 285(1893):20182426, Dec. 2018.
 - [23] **Pablo S. C. Santos**, Frank-Uwe Michler, and Simone Sommer. Can MHC-assortative partner choice promote offspring diversity? A new combination of MHC-dependent behaviours among sexes in a highly successful invasive mammal. *Molecular Ecology*, 26(8):2392–2404, Apr. 2017.
 - [24] **Pablo S. C. Santos**, Alexandre Courtiol, Andrew J. Heideil, Oliver P. Höner, Ilja Heckmann, Martina Nagy, Frieder Mayer, Matthias Platzer, Christian C. Voigt, and Simone Sommer. MHC-dependent mate choice is linked to a trace-amine-associated receptor gene in a mammal. *Scientific Reports*, 6:38490, Dec. 2016.
 - [25] José S. Silva, Pryscilla F. Wowk, Fabiana Poerner, **Pablo S. C. Santos**, and Maria G. Bicalho. Absence of strong linkage disequilibrium between odorant receptor alleles and the major histocompatibility complex. *Human Immunology*, 74(12):1619–1623, Dec. 2013.
 - [26] Eni P. Bompeixe, **Pablo S. C. Santos**, Rafael G. Vargas, Renate von Linsingen, Suelen. C. Zeck, Pryscilla F. Wowk, and Maria G. Bicalho. HLA class II polymorphisms and recurrent spontaneous abortion in a Southern Brazilian cohort. *International Journal of Immunogenetics*, 40(3):186–191, June 2013.
 - [27] **Pablo S. C. Santos**, Johannes Höhne, Fabiana Poerner, Maria G. Bicalho, Barbara Uchanska-Ziegler, and Andreas Ziegler. Does the new HapMap throw the baby out with the bath water? *European Journal of Human Genetics*, 19(7):733–734, July 2011.

- [28] Andreas Ziegler, **Pablo S. C. Santos**, Thomas Kellermann, and Barbara Uchanska-Ziegler. Self/nonself perception, reproduction, and the extended MHC. *Self/Nonself*, 1(3):176–191, July 2010.
- [29] **Pablo S. C. Santos**, Clineu J. S. Uehara, Andreas Ziegler, Barbara Uchanska-Ziegler, and Maria G. Bicalho. Variation and linkage disequilibrium within odorant receptor gene clusters linked to the human major histocompatibility complex. *Human Immunology*, 71(9):843–850, Sept. 2010.
- [30] **Pablo S. C. Santos**, Thomas Kellermann, Barbara Uchanska-Ziegler, and Andreas Ziegler. Genomic architecture of MHC-linked odorant receptor gene repertoires among 16 vertebrate species. *Immunogenetics*, 62(9):569–584, Sept. 2010.
- [31] Caroline. Sens-Abuázar, **Pablo S. C. Santos**, Maria G. Bicalho, M. L. Petzl-Erler, and V. Sperandio-Roxo. MHC microsatellites in a Southern Brazilian population. *International Journal of Immunogenetics*, 36(5):269–274, Oct. 2009.
- [32] **Pablo S. C. Santos**, Johannes Höhne, Peter Schlattmann, Inke R. König, Andreas Ziegler, Barbara Uchanska-Ziegler, and Andreas Ziegler. Assessment of transmission distortion on chromosome 6p in healthy individuals using tagSNPs. *European Journal of Human Genetics*, 17(9):1182–1189, Sept. 2009.
- [33] **Pablo S. C. Santos**, George Füst, Zoltán Prohászka, Armin Volz, Roger Horton, Marcos Miretti, Chack-Yung Yu, Stephan Beck, Barbara Uchanska-Ziegler, and Andreas Ziegler. Association of smoking behavior with an odorant receptor allele telomeric to the human major histocompatibility complex. *Genetic Testing*, 12(4):481–486, Dec. 2008.
- [34] **Pablo S. C. Santos**, Juliano A. Schinemann, Juarez Gabardo, and Maria G. Bicalho. New evidence that the MHC influences odor perception in humans: a study with 58 Southern Brazilian students. *Hormones and Behavior*, 47(4):384–388, Apr. 2005.

Teaching and Outreach

- 2023 - 2024 **Principal Instructor**, *Statistics and Research Methods for Life Sciences ("R You With Me")*, University of Halle
This online course focuses on Statistics and Data Sciences. It is currently being developed and taught by me for a group of 20 life-science professionals in Germany, UK, France, Ethiopia, Tanzania, South Africa and Nigeria.
- 2019 **Principal Instructor**, *Python for Biologists ("Python Time")*, University of Ulm
Developed and taught a new bioinformatics course focusing on Python for life-science researchers (using Requests, Pandas, Seaborn, Matplotlib, Numpy and others).
- 2019 **Principal Instructor**, *R for Ecologists ("The R Hour")*, University of Ulm
Developed and taught an introductory course to the R environment, tailored for researchers focusing in Ecology (using ggplot2, effects, lme4 and others).
- 2019 **Instructor**, *Statistics for Biologists*, University of Ulm
Developed and taught the second half of an introductory course on statistical modeling (from ANOVAs to GLMMs) with R.
- 2014-2019 **Instructor and Developer**, *Master Module on Conservation Genomics*, University of Ulm
Development and teaching of an extensive masters course on Conservation Genomics methods such as NGS, Microbiome Analysis, MHC and Bioinformatic Pipelines.

- 2014-2019 **Teaching Assistant**, *Regular classes in Ornithology, Ecology and Population Genetics*, University of Ulm
- 2018 **Principal Instructor**, *Pre-Master's Course in Biology*, University of Ulm
Developed and taught a preparatory course for a heterogenic group of foreign students entering the Master's programme of the University of Ulm. The course had a strong focus on natural selection, genetics, statistics and bioinformatics, and was extremely well evaluated.
- 2012-2013 **Teaching Assistant**, *Regular classes in Immunogenetics, Genomics and Bioinformatics*, Postgraduate Program in Genetics of the Universidade Federal do Paraná, Curitiba, Brazil
- 2010-2012 **Teaching Assistant**, *Regular classes in Immunogenetics and Evolutionary Biology*, University of Potsdam

Software written by me

- ACACIA** Allele Calling proCedure for Illumina Amplicon sequencing data: This Python-based workflow extracts allele information out of raw, paired-end Illumina sequencing data (or any groups of FASTQ files). It does so by first denoising, filtering and clustering sequences, and then by defining and calling alleles.
https://gitlab.com/psc_santos/ACACIA

Additional Relevant Skills and Interests

- Computer Languages/Methods/OS
 - Linux
 - Bash
 - R
 - Python
 - git
- Natural Languages (Full Proficiency)
 - German
 - English
 - Portuguese
 - Spanish
- Teaching
- Statistical Modeling
- Team Leadership
- Machine Learning
- Data Visualization
- Wikipedia Contributor
- Cycling, Tennis, Sewing and Art



**Der Fachbereich Biologie, Chemie, Pharmazie
der Freien Universität Berlin**

verleiht dem Kandidaten der Naturwissenschaften

Herrn Lic. Pablo Sandro Carvalho Santos

geboren am 24.09.1978 in Brasília D.F., Brasilien

den akademischen Grad

eines Doktors der Naturwissenschaften (Dr. rer. nat.)

nachdem er in ordnungsgemäßem Promotionsverfahren
durch die Dissertation

**» Linkage Disequilibrium and Transmission Distortion
Affecting Human Chromosome 6p «**

Gutachter: Prof. Dr. A. Ziegler / Prof. Dr. H. Hofer

mit der Bewertung » magna cum laude «

und durch die Disputation am 09. 09.2010

mit der Bewertung » magna cum laude «

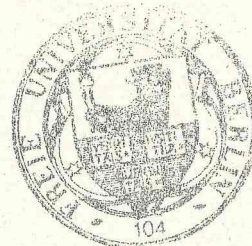
seine wissenschaftliche Befähigung erwiesen und als
Gesamturteil der Promotion

» magna cum laude «

erhalten hat.

Berlin, den 09. September 2010

Dekan
Univ.-Prof. Dr. Hartmut H. Hilger



***Kommission zur Vergabe von
Promotionsstipendien***

Vergabekommission gemäß § 7 NaFöG

Die Kommission zur Vergabe von Promotionsstipendien spricht

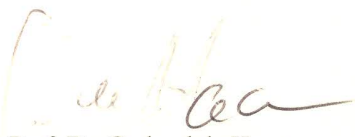
***Herrn
Pablo Sandro Carvalho Santos***

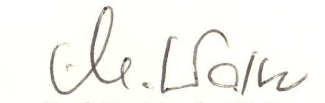
ein Stipendium

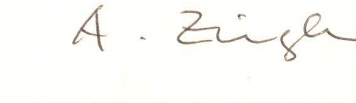
nach dem Gesetz zur Förderung des wissenschaftlichen Nachwuchses

in der 43. Vergaberunde zu.

Berlin, am 03. November 2006


Prof. Dr. Gerhard de Haan
Freie Universität Berlin
Vorsitzender


Prof. Dr. Monika Walter
Technische Universität Berlin
Stellv. Vorsitzende


Prof. Dr. Andreas Ziegler
Humboldt-Universität zu Berlin
Stellv. Vorsitzender

B a d e n – W ü r t t e m b e r g

Z e r t i f i k a t

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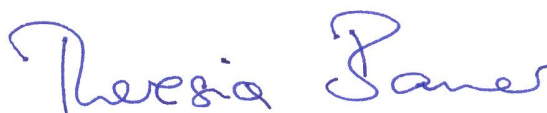
H o c h s c h u l d i d a k t i k

Herrn

Dr. Pablo Santos

wird der Erwerb hochschuldidaktischer Kompetenzen
im Umfang von 200 Arbeitseinheiten bescheinigt.

Stuttgart, den 12. Oktober 2018



Theresia Bauer MdL
Ministerin für Wissenschaft, Forschung
und Kunst Baden-Württemberg



Professorin Dr. Karin Amos
Vorstandsvorsitzende des Hochschul-
didaktikzentrums der Universitäten des
Landes Baden-Württemberg



08/25/2019

Pablo Sandro Carvalho Santos

has successfully completed

Applied Machine Learning in Python

an online non-credit course authorized by University of Michigan and offered through Coursera

A handwritten signature in black ink that reads 'KCT' followed by a stylized surname.

Kevyn Collins-Thompson
Associate Professor
School of Information

**COURSE
CERTIFICATE**



Verify at coursera.org/verify/JG7TQX75VGP3

Coursera has confirmed the identity of this individual and
their participation in the course.