

To Whom It May Concern,

I am writing to apply for the position “Technical Assistant in Ecological Statistics and Data Science” (ID no. 91/2023) at the University of Potsdam. My quantitative background, programming skills, and research interests are completely aligned with the requirements and objectives of the position. Therefore, this opportunity excites me and it would be a great pleasure to join the environment of the Ecology and Macroecology group.

My main areas of expertise are macroecology and biogeography, particularly using mathematical models and GIS tools to understand the effects of human pressure and climate change on biodiversity. I routinely synthesize information from several sources and databases, for which I helped develop a [taxonomic harmonization standard](#). I have also advanced the field of movement ecology and produced novel tools to understand how behavioural preferences influence animal movement (e.g., the R package [enerscape](#), also applied [here](#)). I have outstanding programming skills, especially in R, python, bash, and C, with all my code being version-controlled using git. Additionally, I have high standards and competence for reproducibility, testing, automation, and continuous integration (e.g., using GitHub actions). I authored the R package [enerscape](#) and co-developed [ATNr](#), both currently on CRAN. For larger and more complex projects, I package the code to assure optimal performance and reproducibility (e.g., the [assembly](#) and the [squirrygis](#) packages).

I have authored several R Shiny apps, including: [bifurcation plot](#), [data inspection](#) as supplement for a publication, and [vegetation classification](#) for an ongoing study. I also have experience developing Google Earth Engine apps (e.g., [landscape connectivity of tigers in Nepal](#)), which are easy to scale and maintain. For the last three years, I have been in charge of managing the food web database [GATEWAY](#). I am leading the development of a new version of the database and built an automated [pipeline](#) for its release, to be operative as a SQL (PostGres) database by the end of 2023 on a new website. I am confident with basic concepts of website development (e.g. POST/GET requests) and html (see my personal [website](#)) and I am eager to learn more. I am familiar with some of the largest and most used databases in ecology, such as: CHELSA, WorldClim, BioTime, TetraDENSITY, EltonTraits. I have over ten years of experience with Linux and more than 3 years with high computing clusters. I employ software orchestrating tools (e.g., snakemake) and develop scalable, automated pipelines in bash (e.g., processing [CHELSA climate](#)) in order to maximize research output.

I have several years of experience in data analysis, machine learning, database management, GIS, app development, and species distribution modeling. I used both frequentists and bayesian statistics as well as machine learning methods (e.g. random forest, gradient boosting, GAMs, and Maxent) to conduct my research and support other projects. I have also applied these tools to species distribution models. Additionally, I am developing a novel SDM framework that uses stochastic demography to quantify the effects of climate variability on species’ distribution. Due to my quantitative skills in theoretical ecology and data analysis, I have experience in a supporting role for research. During the last six years, I have had the chance to support and guide PhD students and PostDocs with statistical, mathematical, and methodological advice, including machine learning and

species distribution models. For instance, I helped various students develop a novel mathematical model for the [traveling speed of animals](#), analyze the [drivers of pollutants concentration globally](#), and model [landscape connectivity of tigers in Nepal](#).

I am a very friendly person and open to other cultures and opinions, which helped me establish an international network of collaborators, with whom I share mutual respect and support. I strive to make the working environment a better place, where everybody can feel heard and accepted. Additionally to scientific advice, it is very important for me to help others in their professional and personal growth. For instance, I help students to acquire a set of transferable skills for alternative career paths.

I moved to Leipzig three years ago after completing my PhD. I have visited many places and greatly enjoyed my time in Germany, where I would like to settle down. I have studied German occasionally for the last three years (A2), however I prioritized my academic development whilst waiting for a permanent positions in Germany to learn more advanced German. Given the opportunity, I want to achieve a high proficiency in German and integrate into German society. Further, I have a driving license (AM B) and I am a skilled driver.

In summary, I feel confident that my quantitative background, statistical and programming skills, and mindset strongly align with this position. For me it would be a great pleasure to join the exciting research environment at the University of Potsdam.

Sincerely,

Dr. Emilio Berti

Theory in Biodiversity Science

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