

Software package for the analysis of uncertain or sparse trajectory data

[Stef Sijben](#)

Ruhr-Universität Bochum, Department of Mathematics, Germany, Stef.Sijben@rub.de

Host Institution: Anthropological Institute and Museum, University of Zurich, Switzerland

STSM Host: Erik willems, e.willems@aim.uzh.ch

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Abstract. Widespread use of location-aware devices results in an increased demand for the analysis of movement data. Existing methods have been developed based on the assumption that the movement between sample points is linear, or using no interpolation at all. When sampling rates are low, these assumptions are no longer realistic. Instead movement models based on random processes are used, such as the Brownian bridge movement model (BBMM). The purpose of the visit was to complete a software package that enables advanced movement analysis tasks in the R environment for statistical computing. In particular we focus on analysis tasks in the BBMM that go beyond the well-known utilization distribution, such as detecting movement patterns or investigating movement speeds. We have changed the underlying data format used by the package to be compatible with the *move* package, allowing to use analysis methods from both packages and improving the usability. Additionally, we allow the one free parameter in the BBMM, the diffusion coefficient, to vary with time. This opens up new possibilities to further improve the predictions made by this method, for example by incorporating behavioural information in the model.

Keywords: spatial algorithms, behavioral ecology, trajectory analysis, Brownian bridges