

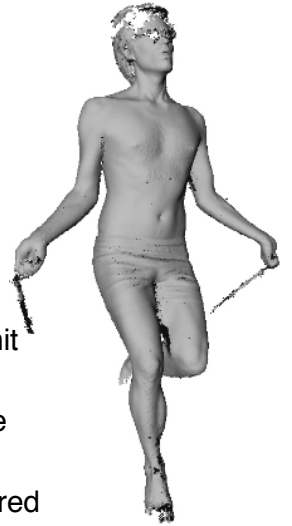


PhD Scholarships in Computer Vision and Machine Learning at the MPI for Intelligent Systems in Tübingen

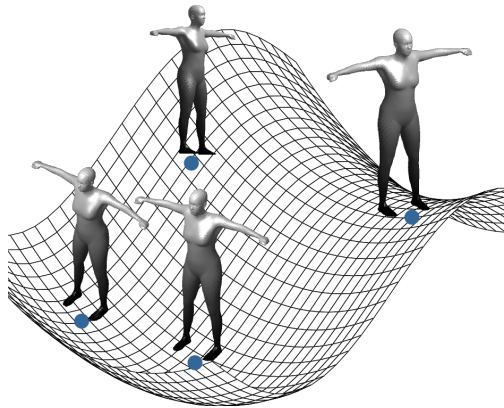
*Meaningful statistics require **consistent representations**, **good distance measures** and **low-dimensional models**.*

Modern machine learning techniques are mostly incapable of handling nonlinear representations and distance measures, which are at the heart of meaningful data modeling. This leads to problems in practical applications where the statistics stop being representative of the data. Consider the simple case of doing statistics on unit length vectors (e.g. SIFT features):

- If we treat these vectors as Euclidean their average will, with probability one, not be a unit vector. The statistics is, thus, not consistent with the data and we have lost its meaning.
- If we enforce the unit length constraint during statistics we need a new notion of distance as the shortest path between points is no longer the straight line.
- If we insist on using a Euclidean model the results will have less significance as we ignored the dimensionality reduction provided by the constraint.



Now imagine more complex constrained data: *mesh deformations* should preserve outward pointing surface normals; *object contours* should be independent of parametrization; *covariances* should stay positive definite and so forth. In such scenarios the above problems becomes a significant hurdle to progress, and the solution is still missing.



Does that bother you? And do you want to help find solutions?

The **Geometric Statistics** research at the MPI for Intelligent Systems aims at solving these problems by modeling constrained feature spaces geometrically. Our work is both theoretical and applied, with a particular focus on the problems occurring as part of the larger MPI effort to build the worlds best model of human body shape.¹

Talented students interested in other related research areas are also encouraged to apply.

You should have an excellent Master's degree in computer science, mathematics, or a related field with a focus on mathematical modeling and algorithmic development. You are determined to build the best possible models of the world, and you are not afraid to challenge the status quo. You have previous research experience (e.g. internships, research papers, etc.) and we expect that you know why you want to do a PhD with us.

We at the MPI for Intelligent Systems in Tübingen offer a friendly working environment in a lovely old town, situated in a hilly area south of Stuttgart, Germany, with a high quality of life. Max Planck Institutes are internationally renowned and regarded as one of the worlds foremost organizations for fundamental research. This PhD position is open at the Perceiving Systems² Department, headed by Prof. Michael Black and will be supervised jointly by Søren Hauberg and Michael Black. The working language is English. The Max Planck Society is an equal opportunity employer; women and people with disabilities are encouraged to apply.

To apply for this position, please send your application to ps-apply@tuebingen.mpg.de. Your application must include your CV, university transcripts, academic records, references to (international) people who can talk about your research abilities and a research statement. Please include your thesis and, if available, your latest research papers. If you have any further questions about this position, please contact us.³

¹http://ps.is.tuebingen.mpg.de/theme/Body_Shape

²<http://ps.is.tuebingen.mpg.de>

³<http://ps.is.tuebingen.mpg.de/departments>