

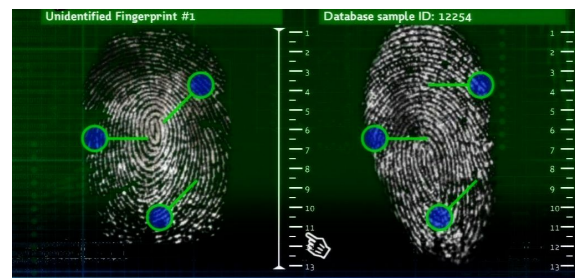


BA/MA/SA/Group:

## Nearest Neighbor Search in Ultrametric Spaces

An ultrametric space is a metric space where the triangle inequality is replaced with the maximum distance. Ultrametricity is a pervasive property of observational data. It grows as dimensionality and sparsity arise and is often observed in practical data. It has many applications such as forensic data exploration and data recordings. Additionally, the nearest neighbor search problem is a primitive in high dimensional geometry. It has a variety of applications in different fields, such as computational biology, big data, data mining and machine learning.

In this thesis, you will attempt to combine these two. You will investigate ultrametric spaces and delve into embeddings into other metric spaces. You will question whether the nearest neighbor search problem can be solved using uncommon dimension reductions. Can you achieve something better when you strengthen the triangle inequality?



**Requirements:** Basic knowledge of probability theory and algorithmic design. Mathematical maturity and basic geometry will be an advantage.

**Interested? Please contact us for more details!**

### Contacts

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