

# Spike Sorting - Data Mining Project

## Progress presentation

Robert Strack   Beata Strack

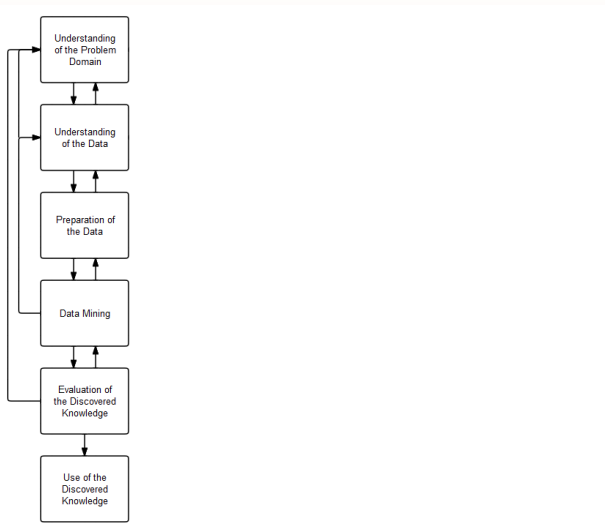
Department of Computer Science, Virginia Commonwealth University

October 5, 2010

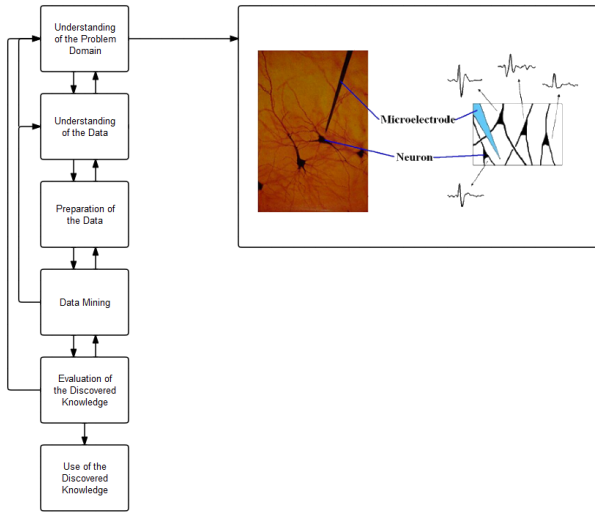
# Outline

- 1 Introduction
- 2 Methods and results
- 3 Further plans

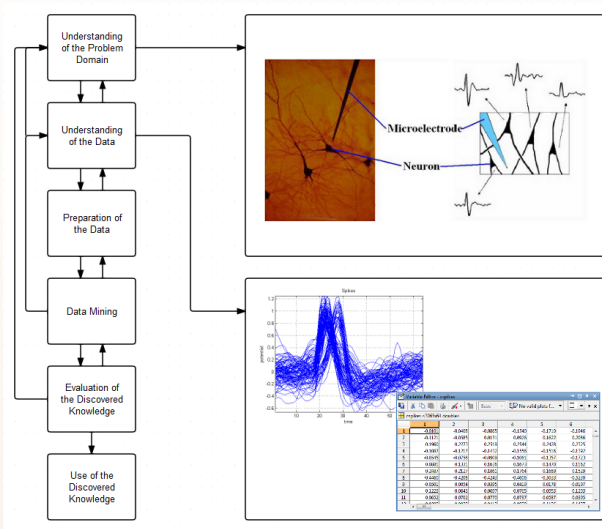
# Steps of Knowledge Discovery Model



# Understanding the Problem



# Understanding the Data



# Applied methods

- Feature extraction
  - PCA
  - MDS
    - Euclidean (standardized Euclidean)
    - Chebyshev
    - Spearman
  - Fourier Transform
  - Wavelets (Daubechies)
- Clustering
  - K-means
  - hierarchical clustering
  - Gaussian Mixture Model
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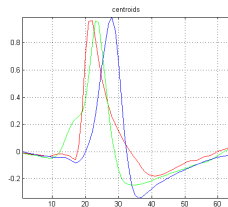
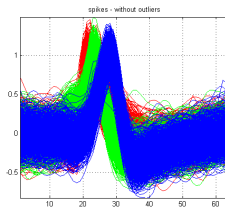
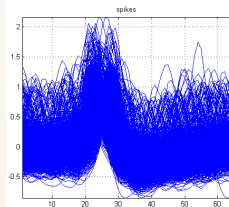
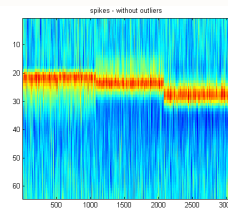
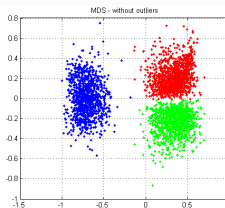
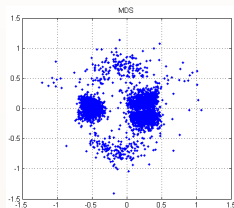
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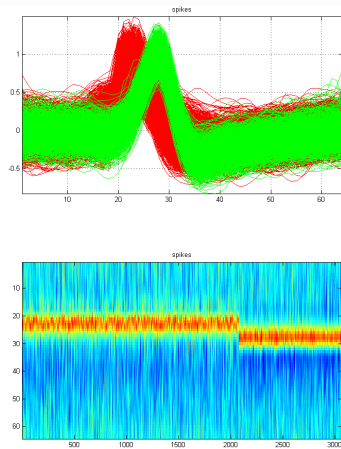
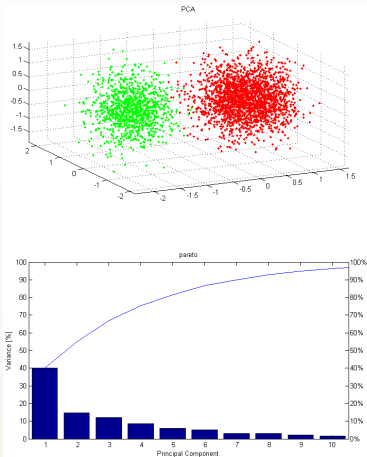
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# Removing outliers (Chebychev metric)

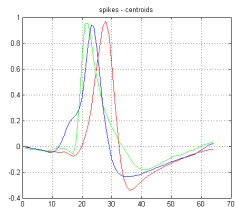
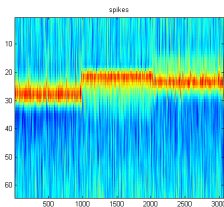
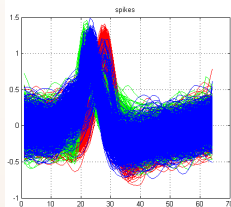
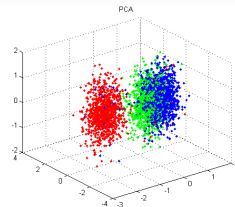
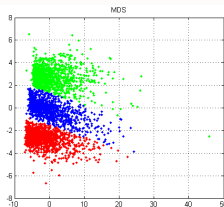
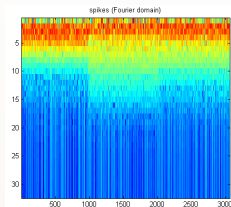




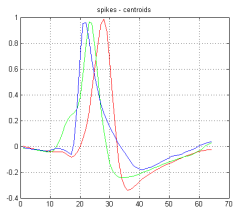
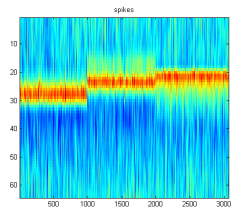
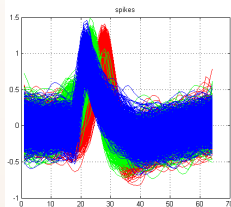
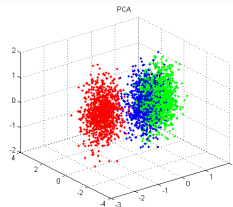
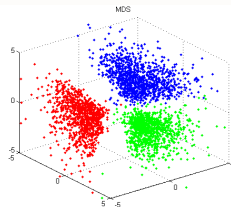
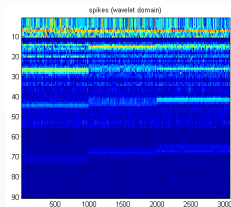
# PCA



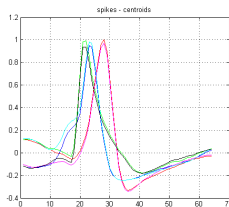
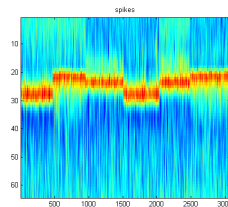
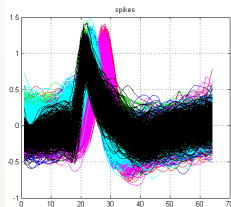
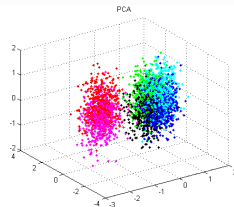
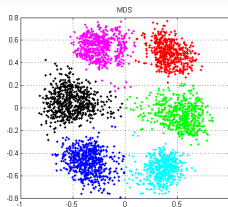
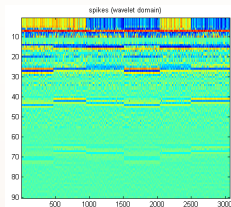
# Fourier Transform and MDS (Stand. Euclidean metric)



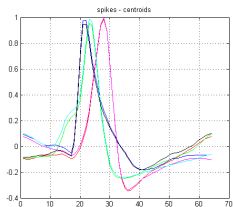
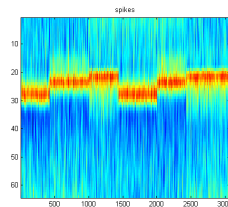
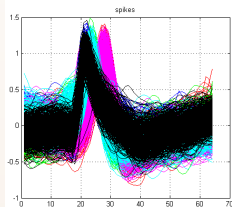
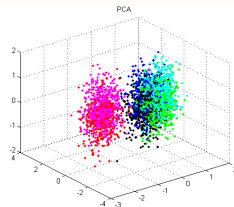
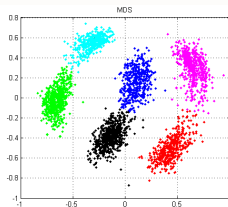
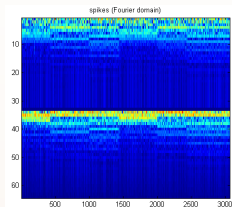
# Wavelets and MDS (Stand. Euclidean metric)



# Wavelets and MDS (Spearman metric)



# Fourier Transform and MDS (Spearman metric)



# Further plans

- other clustering algorithms (especially for the data after Fourier transform)
- validation of the clustering
- apply methods for second dataset
- classification part of the project
  - Support Vector Machines
  - other Feature Extraction methods

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# Questions & Answers

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