

# Mathematica vs. R — Advanced use cases

## 1 Main parts

- Summary of last year's presentation
  - The great features of R
    - Writing articles and documentation
      - Documentation integration with LaTeX, Markdown, and HTML
    - The R package systems
    - Great IDE's support
    - Interactive interfaces building and deployment
  - RStudio
  - R design critique
  - Data structures
- The simple functionalities missing in Mathematica but present in R
  - CrossTabulate
  - VariableDependenceGrid
  - MosaicPlots

## R graphics

- The three graphics systems
  - lattice
  - ggplot2
  - base
- No 3D
  - Finding outliers in 2D and 3D numerical data
    - Making this work in R is **much** harder

## Illustrative example for the differences

- Work with data frames
- Graphics
- General work flow
- General on "functionality gathering"

## Responses to observations in WTC-2016 talks

- R scripts
  - Documentation
    - SparkR guide
    - SparkR on Amazon
  - SparkR
  - Chat bots
    - R code
- Dynamic interface of ODEs
  - ODEs with seasonalities
- From time series to brain networks
  - Hub-items recommender
  - Time series search engine
- Geo-mapping
  - Using Yelp

## The rest of the advanced used cases

## 2 Mathematica vs. R at GitHub

- Time series analysis with Quantile regression
  - very illustrative example on differences between Mathematica and R
- Handwritten digits classification
  - MNIST data base
  - Extensions
    - Comparison between SVD, NNMF, and ICA
    - Comparison with built-in classifiers
- Banking data obfuscation
- Data wrangling

## 3 Advanced use cases

- Not in MathematicaVsR**
  - Some are being prepared to go there
- Functional parsers
  - Chat bot dialogs
    - Mathematica
      - MSE FunctionalParsers.m
      - WordPress
    - R
      - FunctionalParsers.R
  - Chemical equations parsing
- Movie recommender
  - Shiny interactive interface
- Tries with frequencies
  - Mathematica
    - "Tries with frequencies for data mining"
  - R
    - TriesWithFrequencies.R
- Topics extraction from NPR scripts
  - Mathematica
    - "Statistical thesaurus from NPR podcasts"
    - NonNegativeMatrixFactorization.m
  - R
    - NonNegativeMatrixFactorization.R
- Finding outliers
- Combining recommenders
  - Through S3