

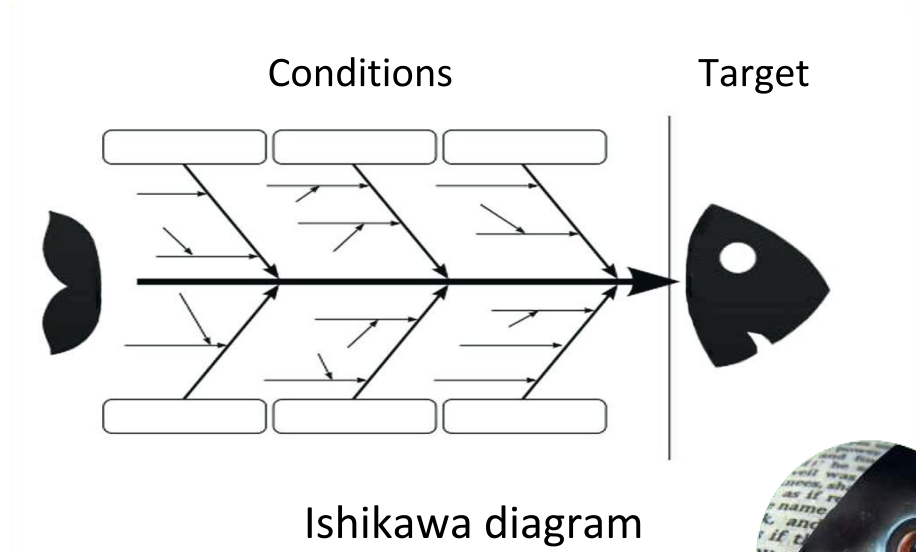
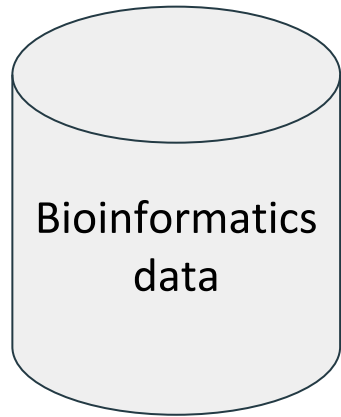


# Association rule mining using fishbone diagrams

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# Project concept



# Why do we need new ARM method?

***Fishbone ARM method***: ARM + information theory

	<b><i>FP-growth</i></b>	<b><i>Decision Tree</i></b>	<b><i>Fishbone ARM</i></b>
<b><i>Hierarchical rules</i></b>	-	-	+
<b><i>Visualization</i></b>	Table	Table, tree	Table, graph, fishbone
<b><i>Interpretability</i></b>	Ok	Good	Good

# Project goals and objectives

**The goal:** validate ARM approach with existing data and apply it to non-published data

- Improve method usability
- Explore the bioinformatics article and extract scientific statements
- Check obtained statements with ARM approach
- Find and investigate new statements from non-published data

# Improving service usability

**Old service:** command line tool to run fishbone algorithm + web page for visualization

**New service:** client-server application with UI to run analysis using different algorithms and visualize results

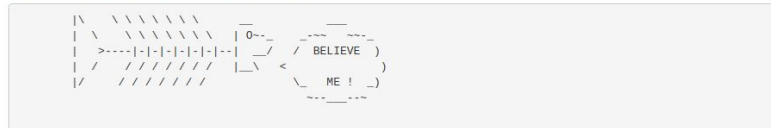
Run analysis on data files  Load result files Run other algorithms  FPGrowth  Decision tree

Predicates  Database  Experiment type:

Display settings: Type  Target   ≤ Correlation ≤  Support ≥  Confidence ≥  Conviction ≥  Complexity ≤  Show  Show other results  FPGrowth  Decision tree

## Fishbone

Associated Rules Learning + Information Theory = Fishbone (Ishikawa) diagram.

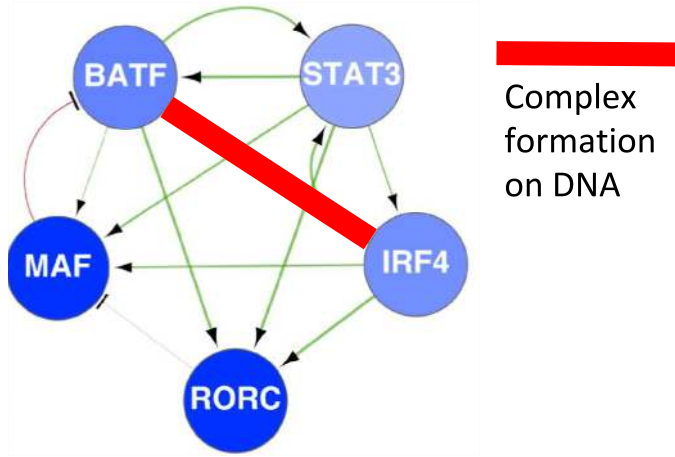


Developed by JetBrains Research.

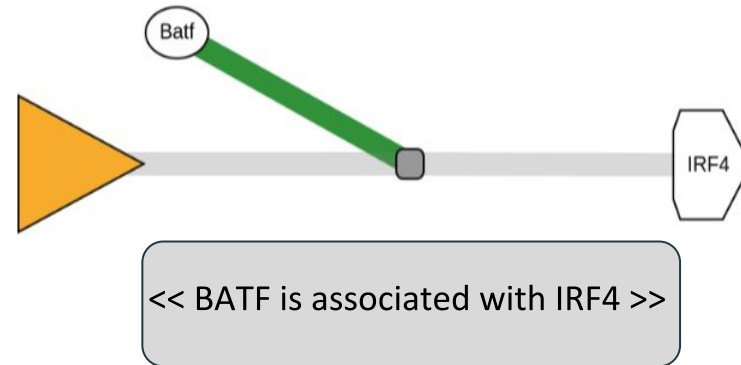
# Validating method with public data

*A Validated Regulatory Network for Th17 Cell Specification (Ciofani et al., 2012)*

TF feedback loops in Th17 (from the article)



Fishbone diagram based on article's data



# Results

- Provided client-server application with extended UI for Fishbone ARM method
- Method was validated using known rules from published data
- More biological rules to be investigated