# Tetrahedron: Barycentric Measure Visualizer

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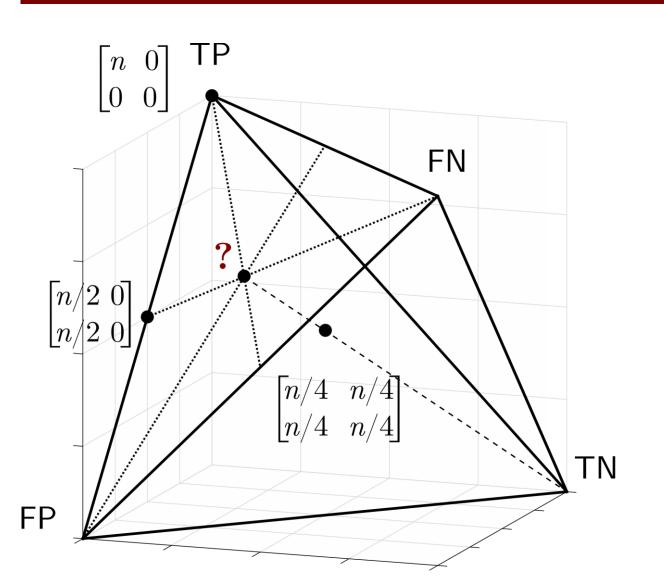
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#### Motivation

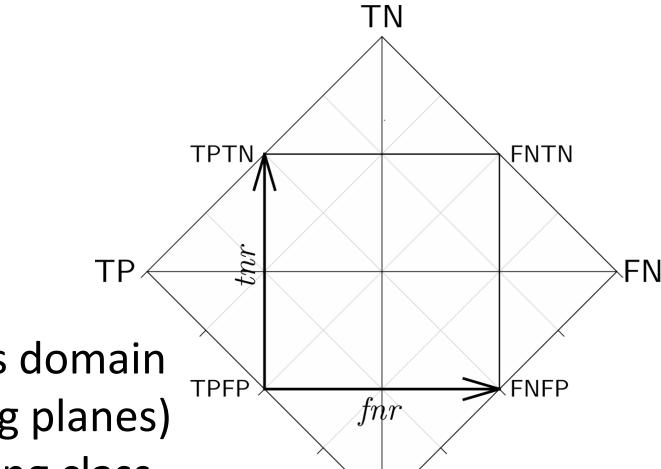
- Numerous measures available for classifier evaluation and rule interestingness
- What are the differences between these measures?
- What are the properties of each measure (min, max, monotonicity, symmetry)?
- How to select the 'best' measure for a given task?

Predicted Actual	Positive	Negative	total
Positive	TP	FN	P
Negative	FP	TN	N
total	$\widehat{P}$	$\widehat{N}$	n

#### **Barycentric Visualization**

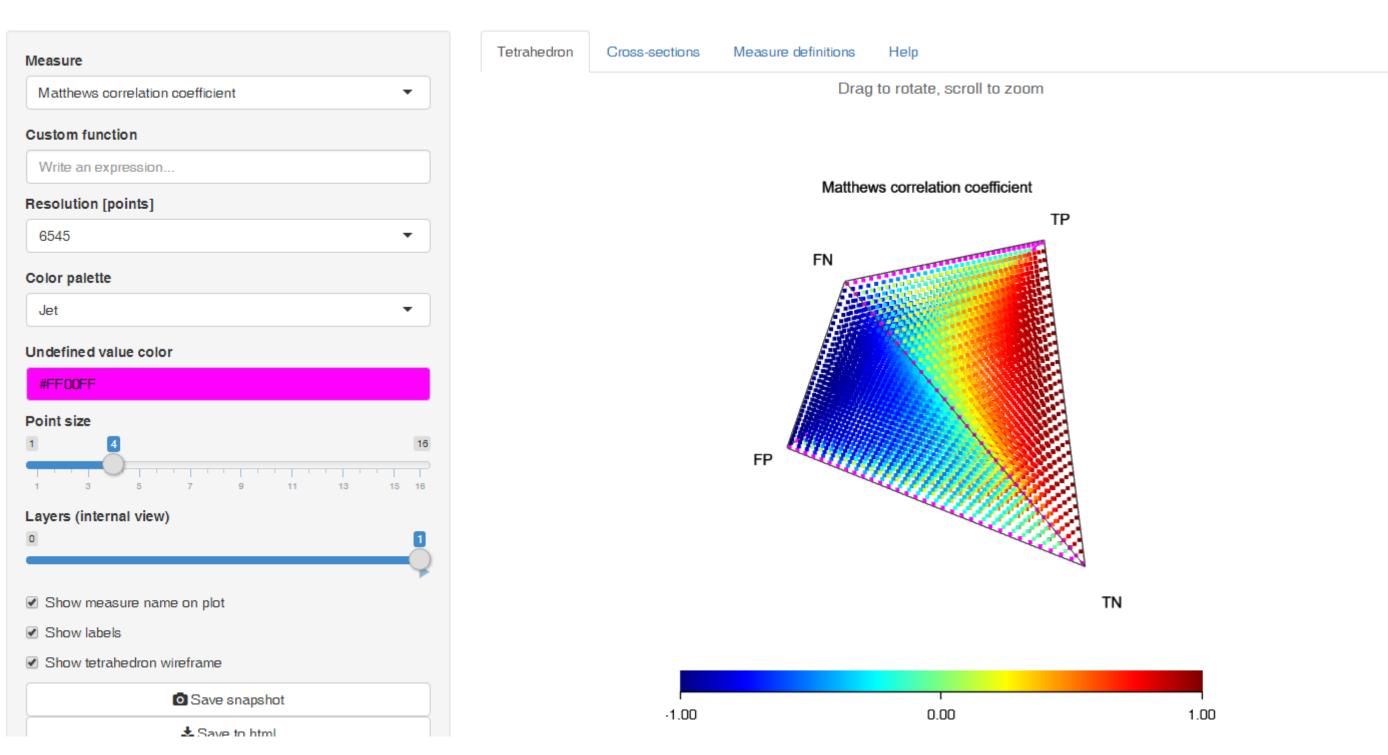


- In the barycentric coordinate system each confusion matrix is represented as a point of a 3D tetrahedron
- The value of a measure based on the depicted four values may be rendered as color

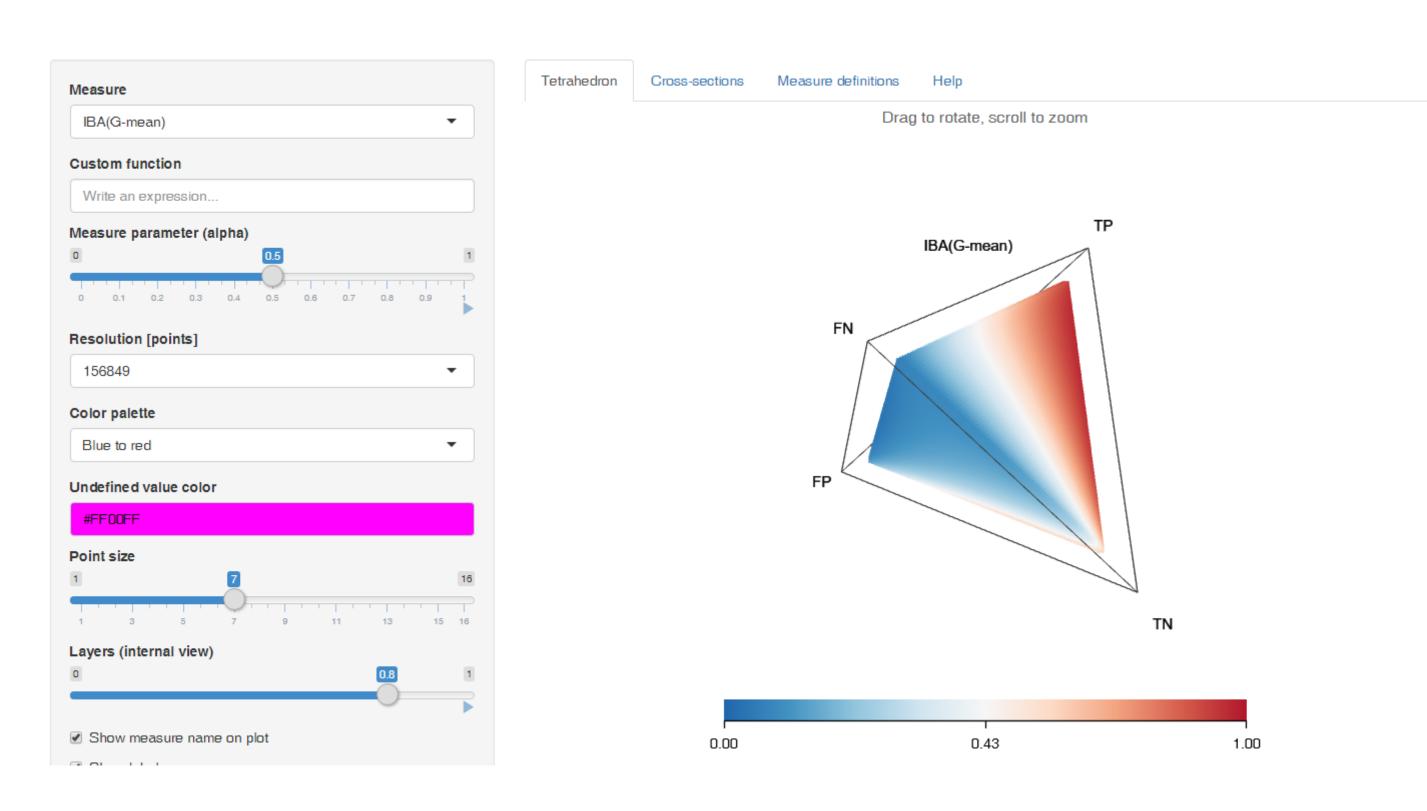


- Visual comparison of measures
- Visual detection of properties
- Insight into full range of measure's domain
- Consecutive cross-sections (cutting planes) depict measure behavior in changing class or prediction proportions

#### Measure Visualizer

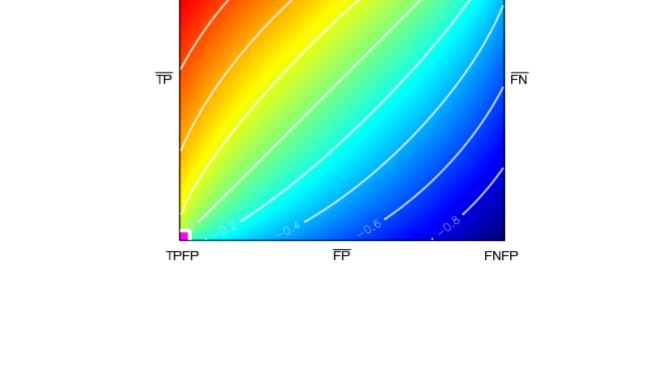


Interactive 3D WebGL visualization



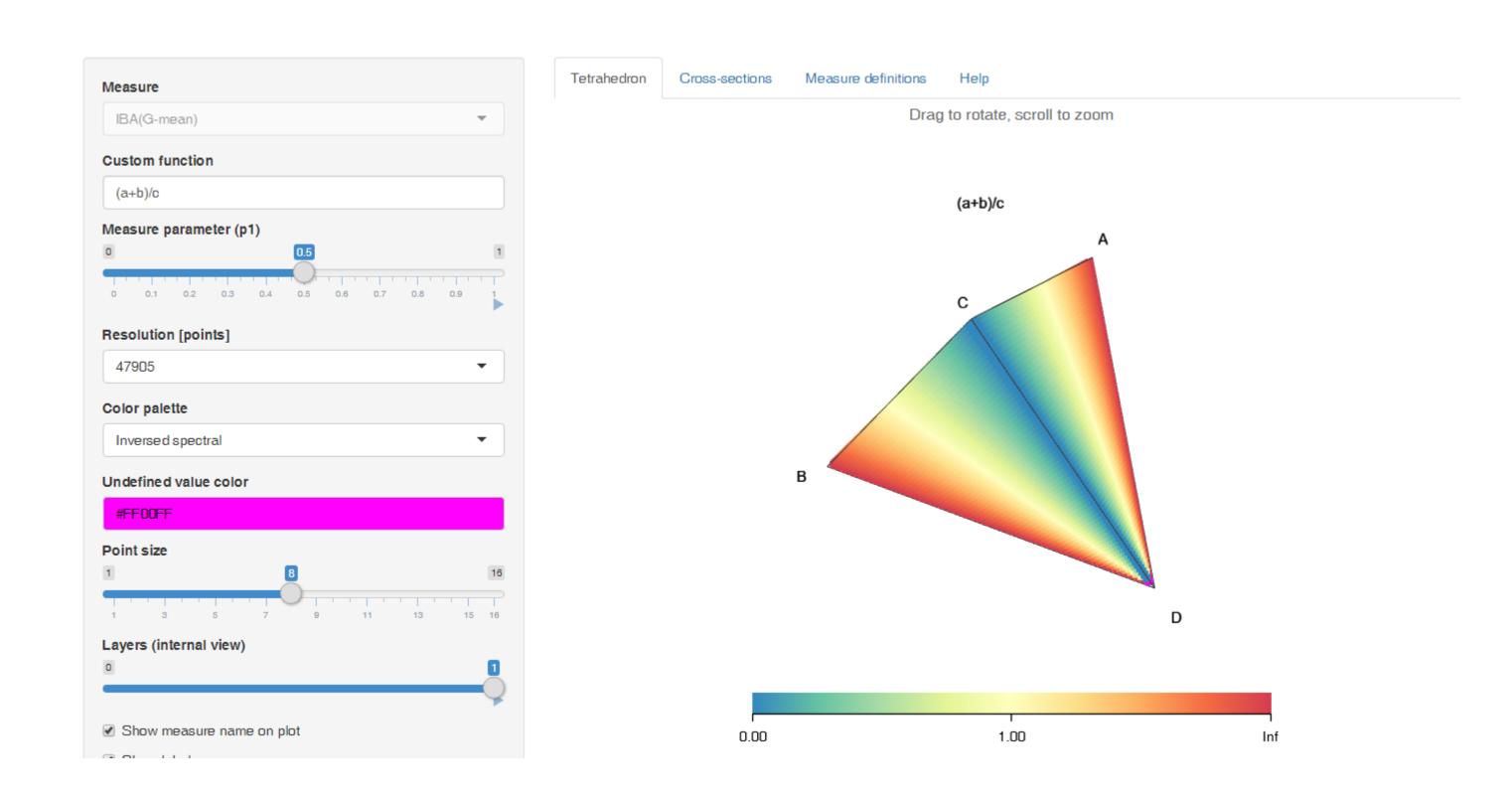
**Parameter animations** 

# Measure Matthews correlation coefficient Custom function Write an expression... Minority ratio 0.1 0.1 0.2 0.3 0.4 0.5 0.8 0.7 0.8 0.9 Color palette Jet Undefined value color #FF00FF Show measure name on plot Show labels Show contour Save image png ▼



#### **Cross-sections for various imbalance ratios**

Tetrahedron Cross-sections Measure definitions



Support for user-defined formulas

### Try the demo



#### Get the code



https://dabrze.shinyapps.io/Tetrahedron/

https://github.com/dabrze/Tetrahedron