A Three-Step Approach to Characterizing Consumer Segmentation via Machine Learning

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- Background
- Scenario
- Three Step Approach
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  - Step 2: Segmentation
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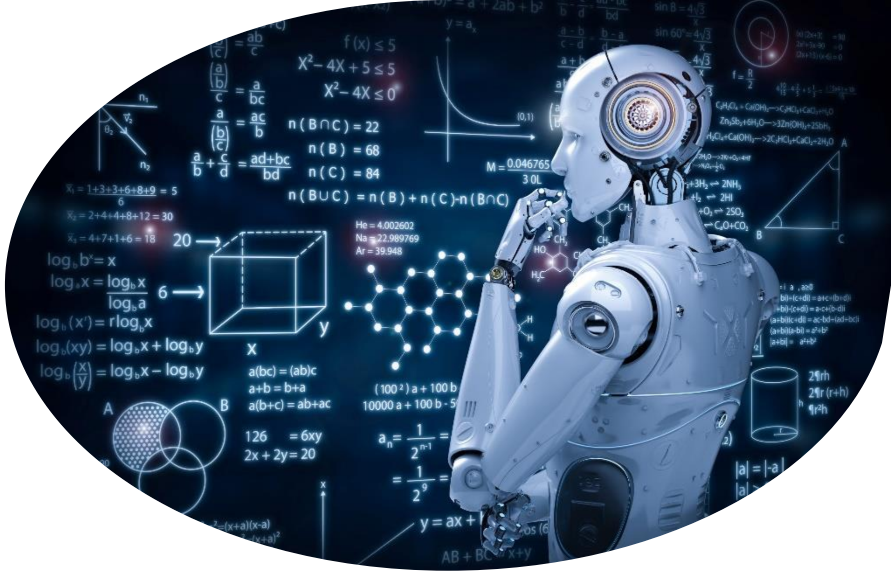
    - Machine Learning Approach
- Conclusions



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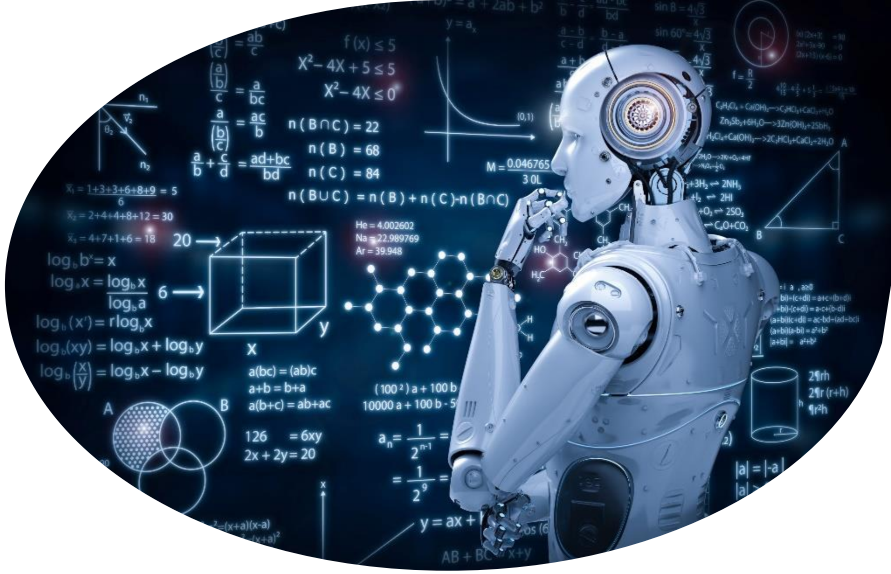
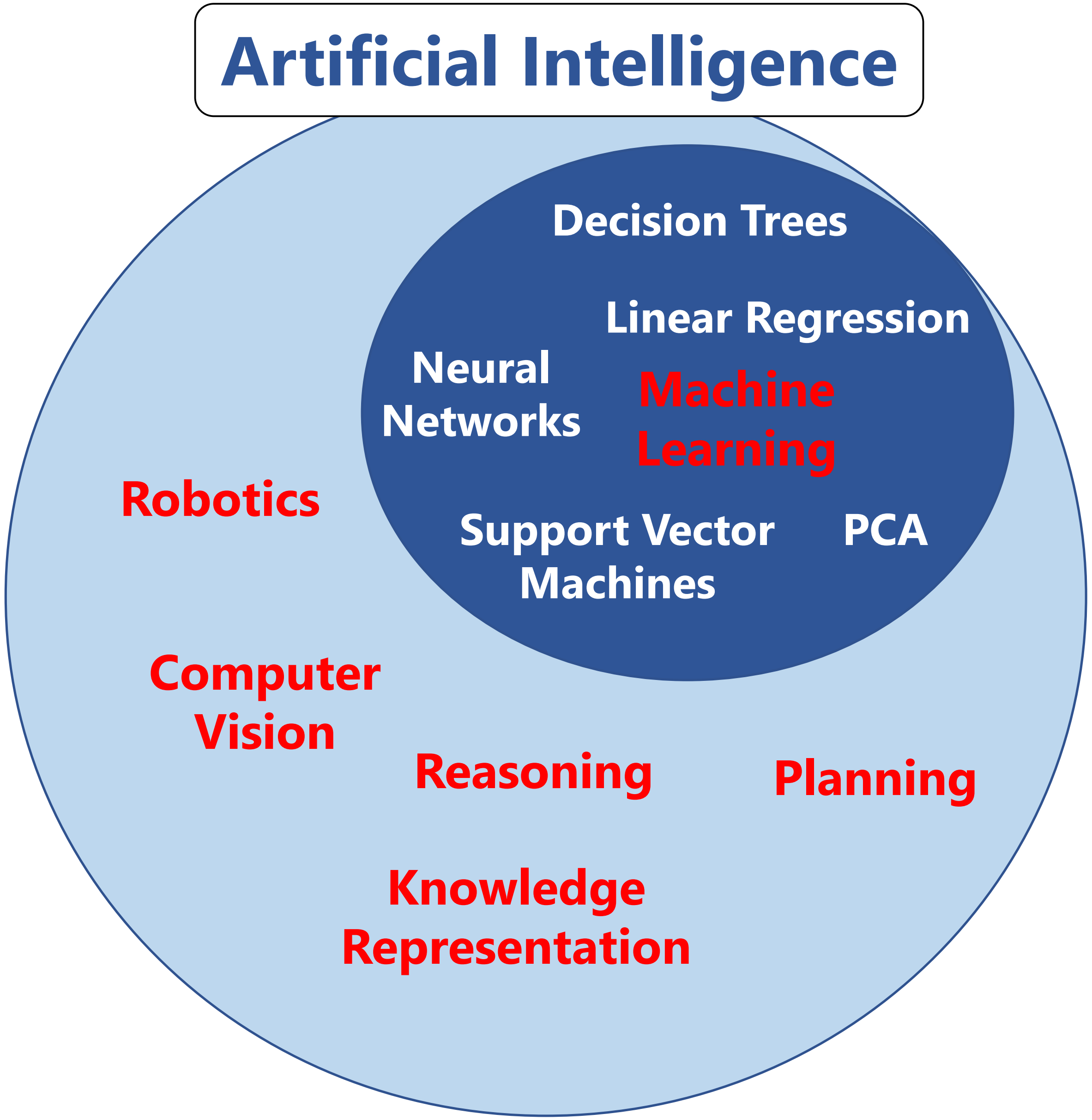


Background

Artificial Intelligence (AI) and Machine Learning?

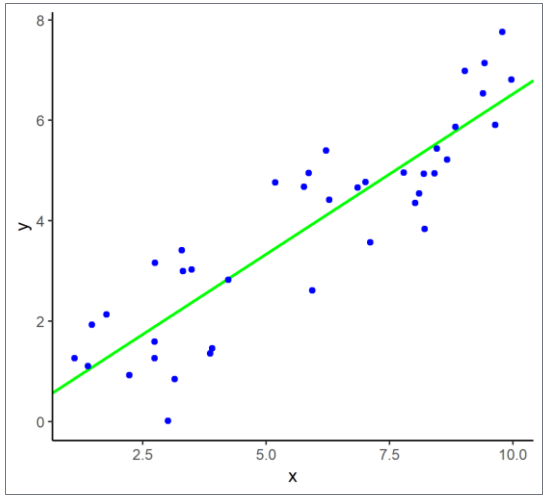


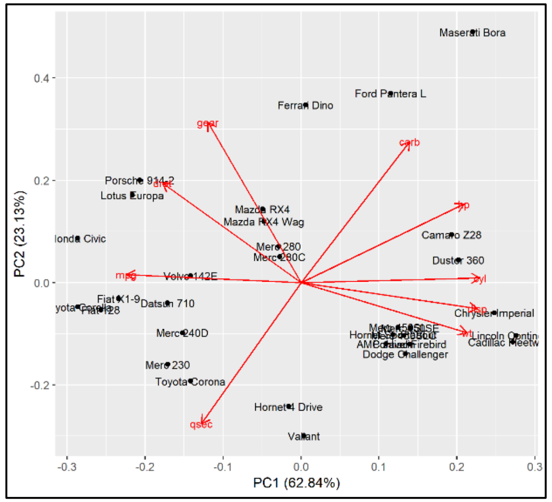
- Goal of AI is to either model human intelligence or create rational agents
- Machine Learning focuses on improving task performance with additional data
- Machine Learning is a subfield of AI

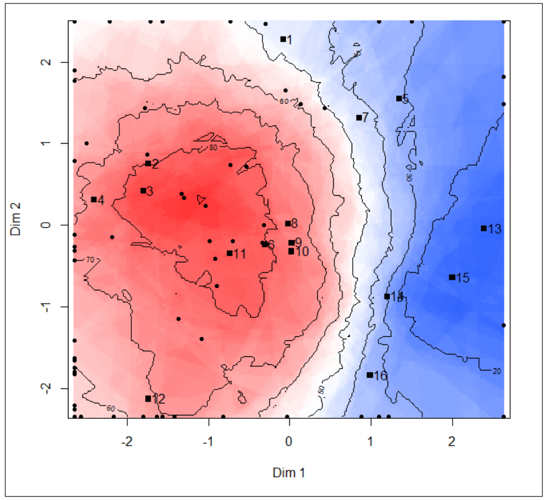
Applications of AI

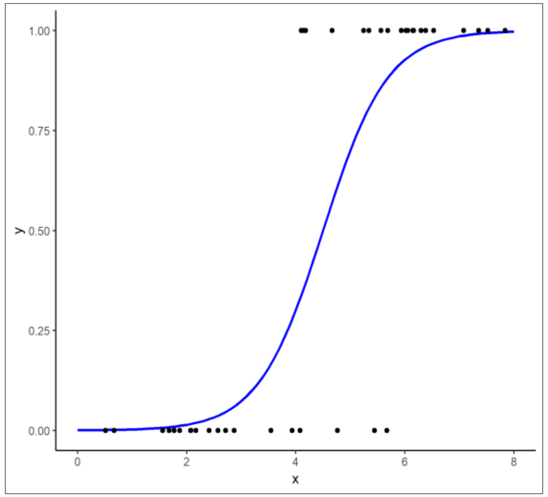
- Similar to introduction of applications of electricity
- Current techniques and approaches will evolve
- New techniques and opportunities will arise

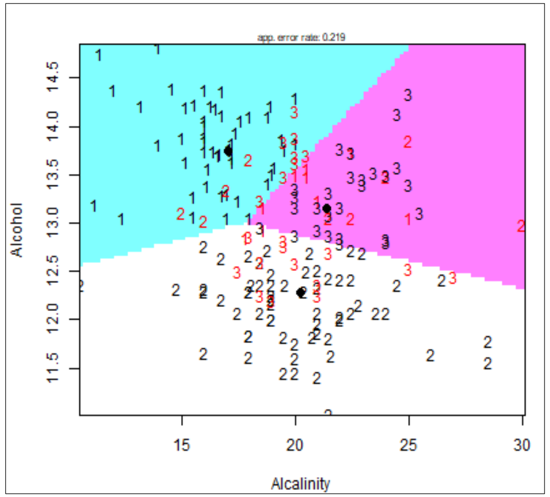
Standard Machine Learning Techniques

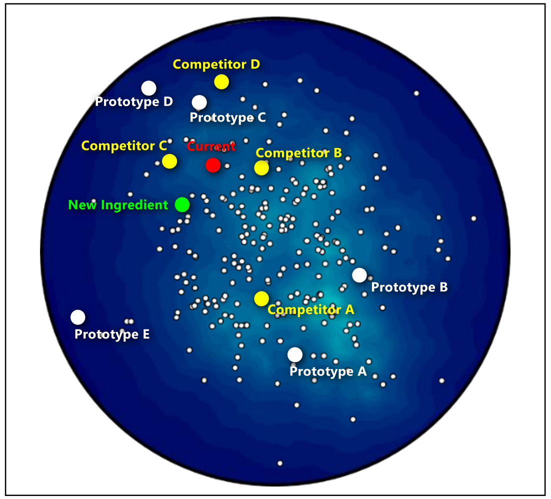










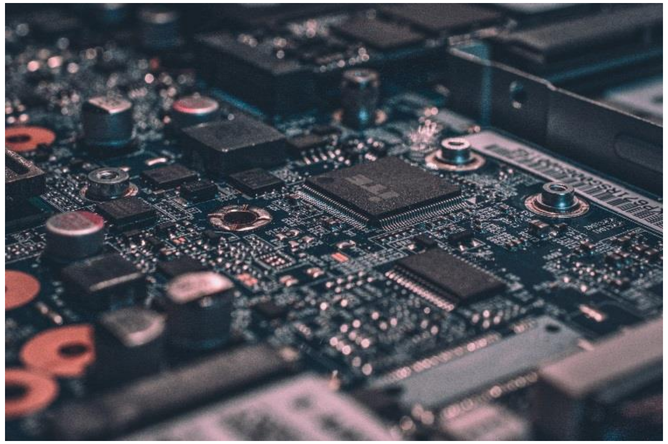


Linear and Logistic Regression

Dimensionality Reduction

Mapping and Unfolding

Machine Learning Advances

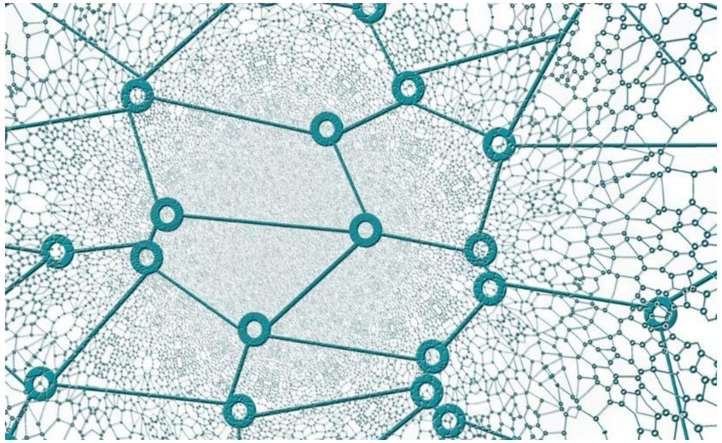


Computational Power

Algorithmic Improvements

Crossover from Other Fields

Applications of Machine Learning

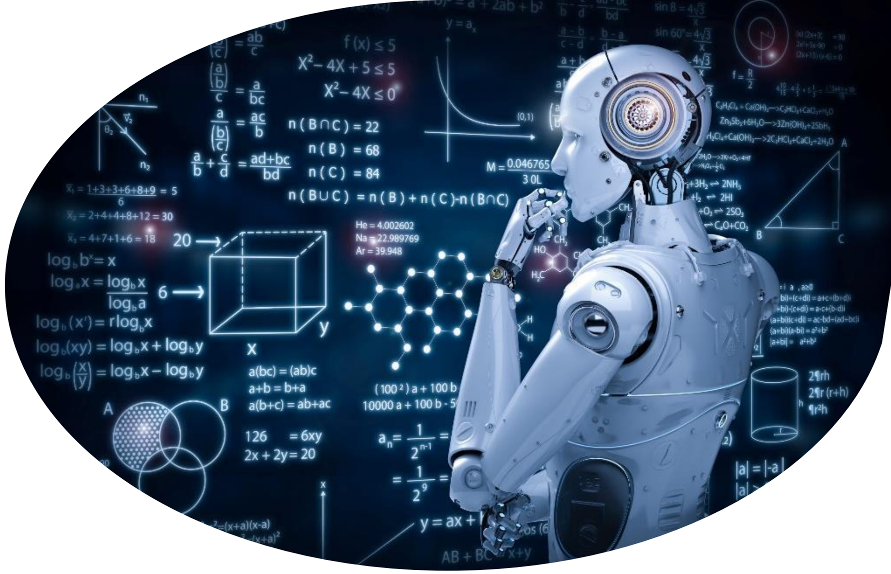


Large Quantities of Data

Combinations (Combinatorial Explosion)

Regression and Classification

But data quality is still paramount!



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Scenario

Scenario
(Inspired from a Client Project)

- Brand of boutique barbecue sauces
  - Need well-positioned portfolio of sauces for the US national market
  - Nationwide category appraisal
    - 8 test products evaluated over two days
      - 5 own (current brand, 4 prototypes) B_1 B_2 B_3 B_4 B_5
      - 3 competitors C_1 C_2 C_3
    - N=423 category users

- Question:
  - To whom should we market which product?

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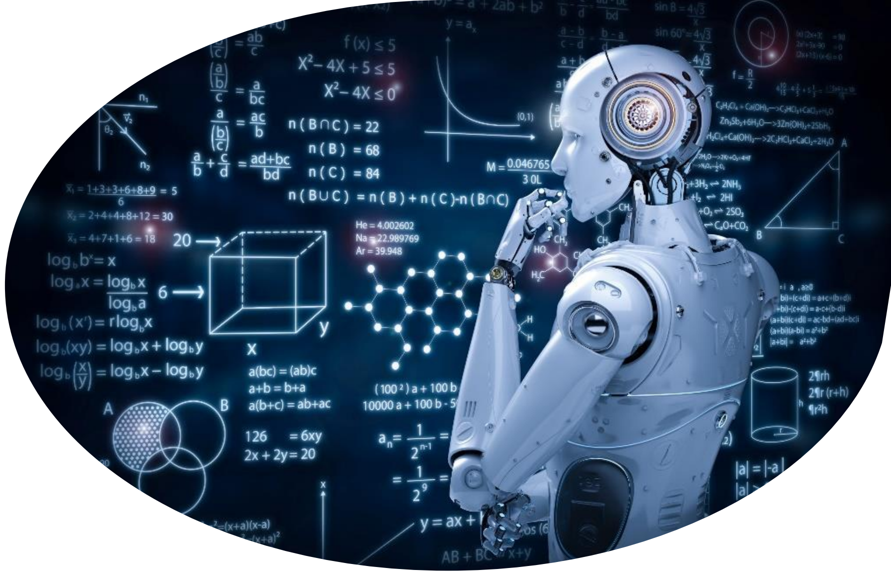
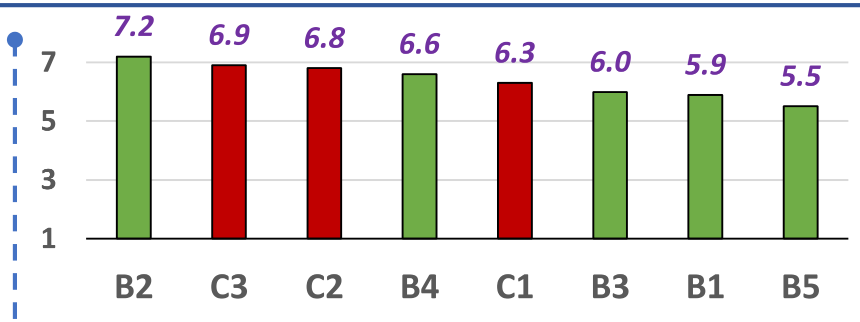


Three Step Approach

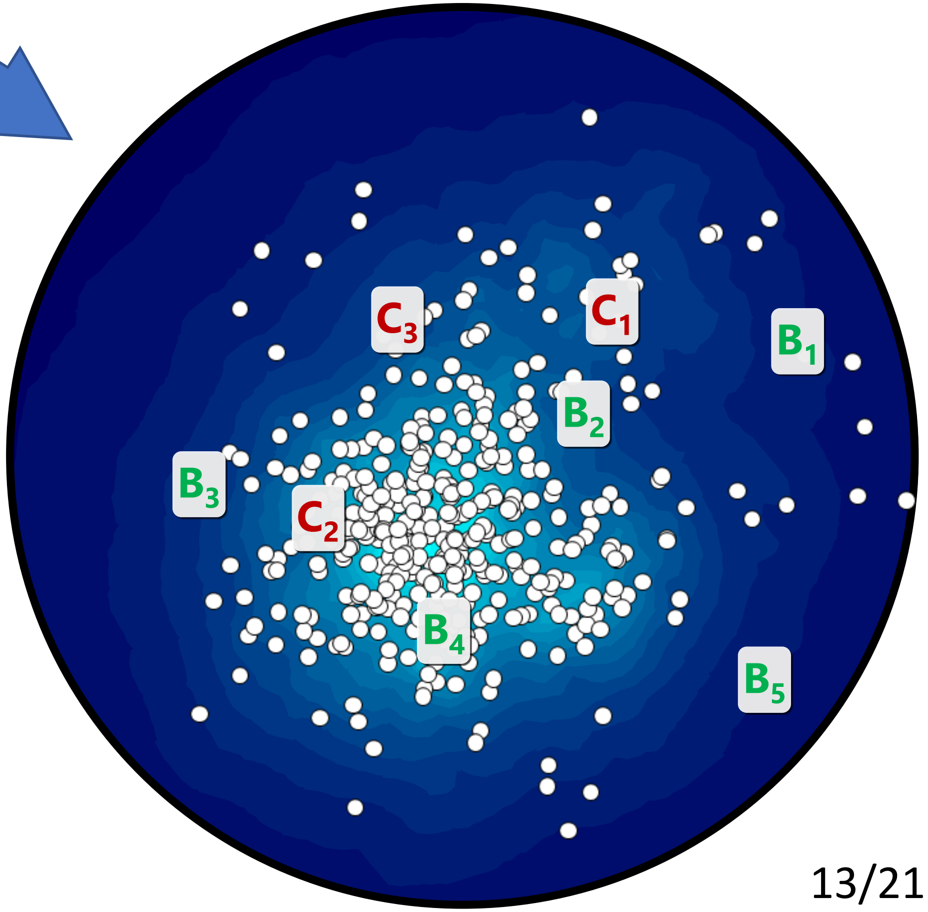
Step 1: Unfolding



- Unfold the liking data to Landscape Segmentation Analysis® (LSA) map

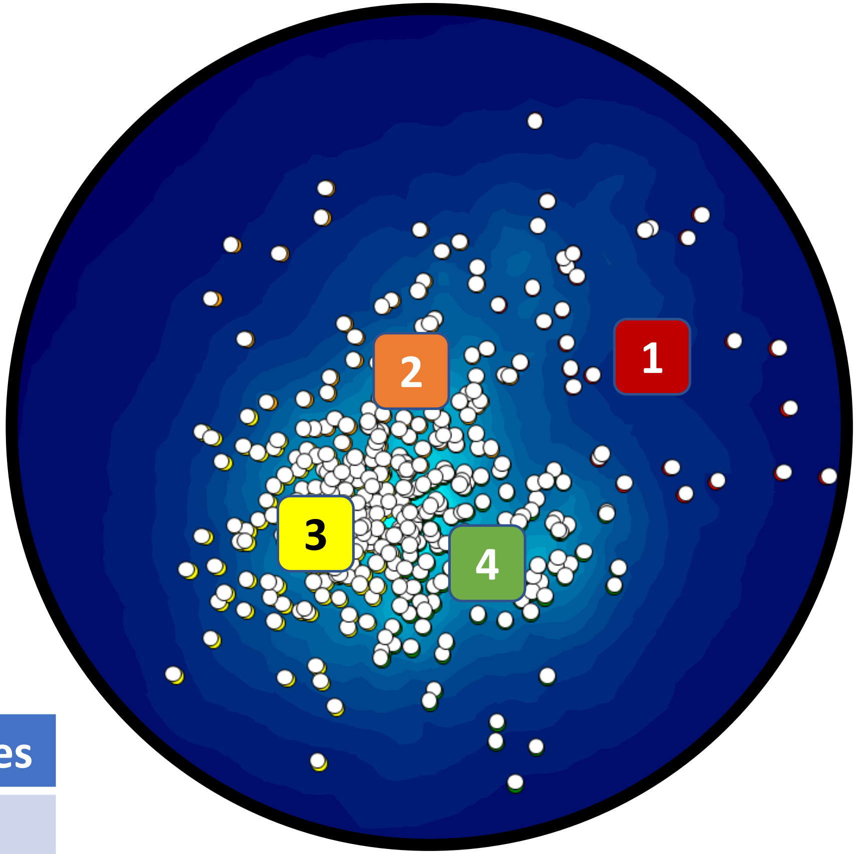
- Respondents with similar liking patterns have similar ideal locations

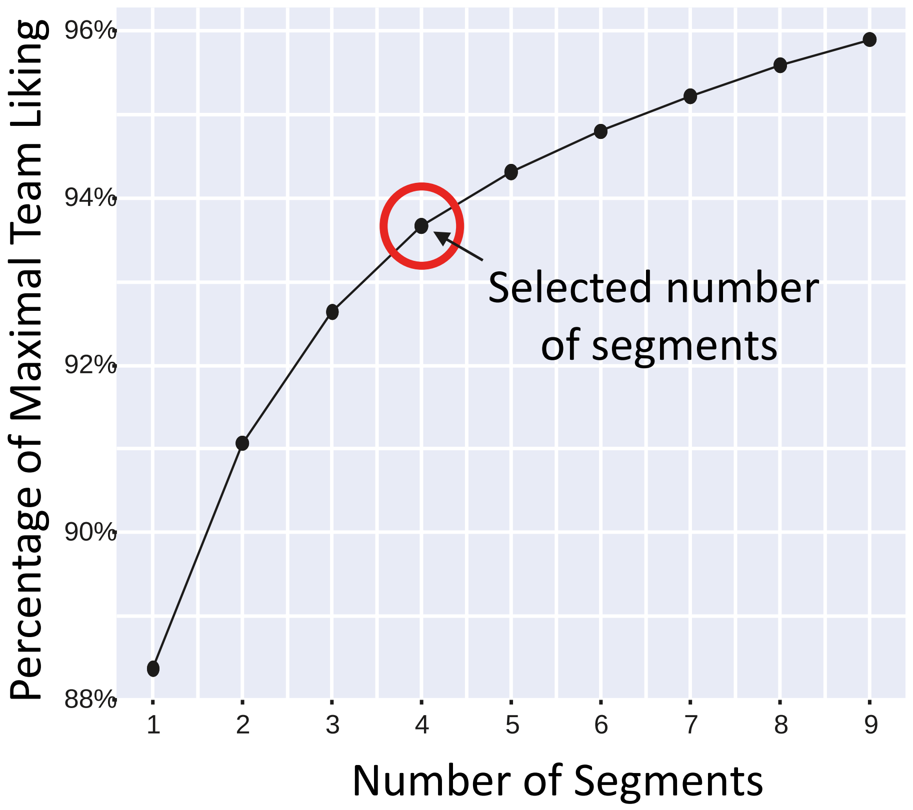
- Use ideals to conduct consumer segmentation



Step 2: Identify Consumer Segments

- Cluster individuals into segments with similar liking patterns using portfolio optimization
- To decide how many segments, use a scree plot
- Diminishing returns appear at four segments

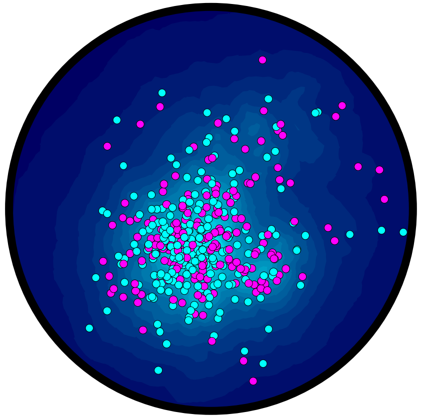




Segment	Counts	Percentages
1	75	18%
2	94	22%
3	162	38%
4	92	22%

Note: Machine learning tools generally perform best when there are roughly equal numbers of subjects in each cluster

Step 3: Characterizing the Segments



Standard Approaches?

or

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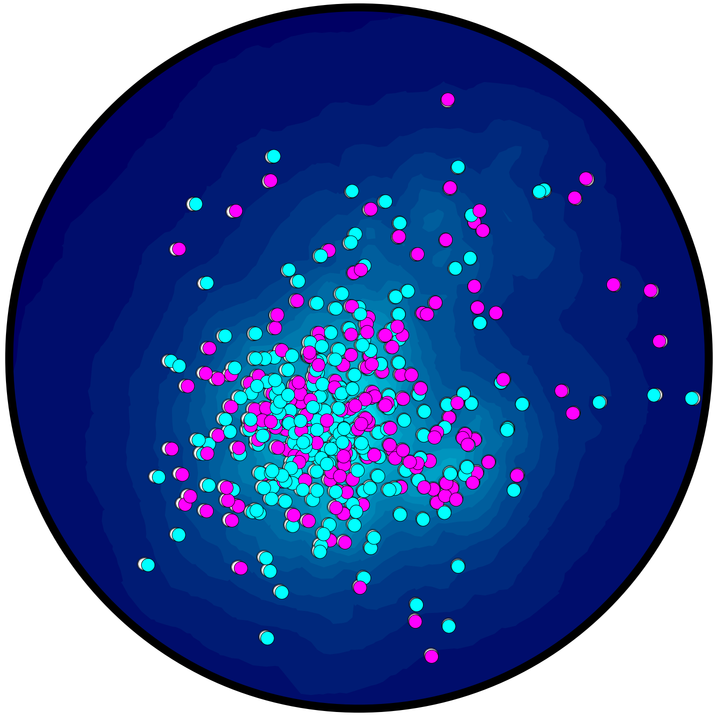
(ROOT)

Machine Learning Approach?

Standard Approaches

- Consider various pre-defined consumer groups
- E.g. color-coded by gender
- Means not significantly different

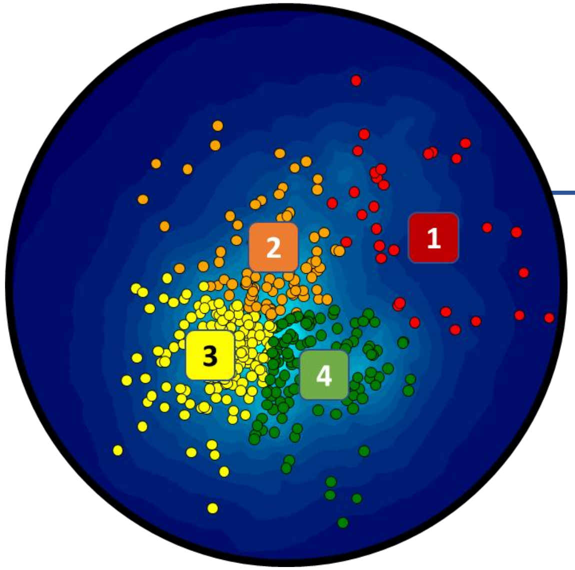


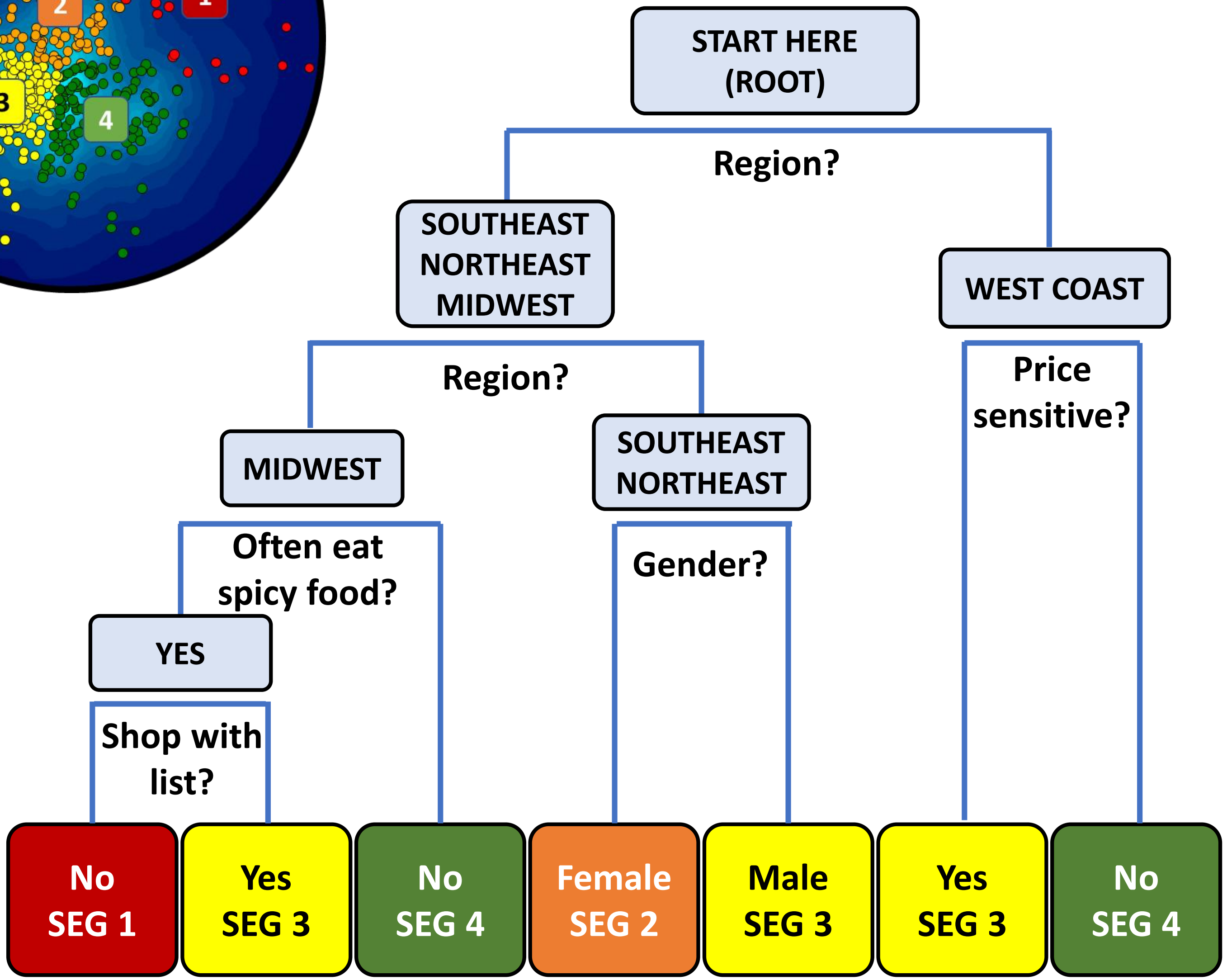
Examine hedonic clusters
one consumer variable at a time

Segment	Men	Women
1	57%	43%
2	38%	62%
3	63%	37%
4	63%	37%

Segment	Southeast	Midwest	Northeast	West Coast
1	28%	44%	20%	8%
2	34.%	13%	37%	16%
3	21%	24%	23%	33%
4	23%	30%	24%	23%

Machine Learning Approach

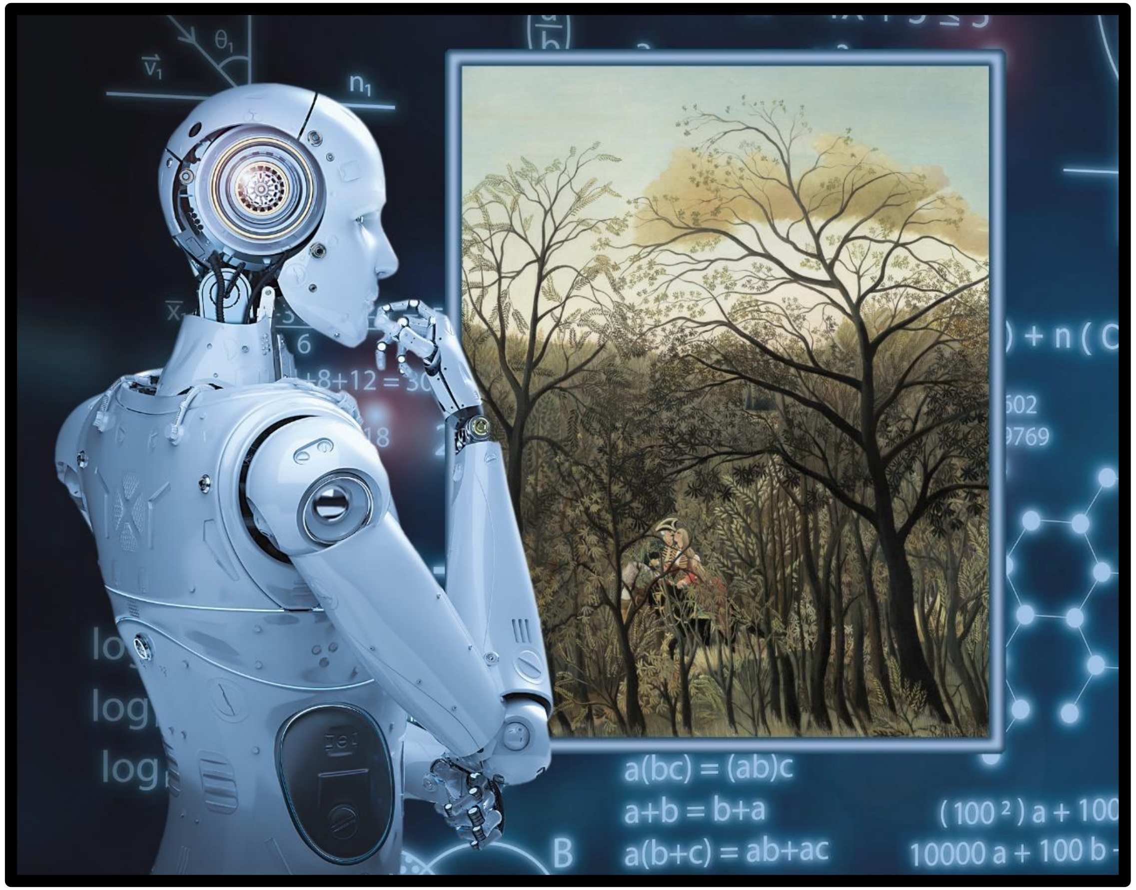




- Using demographic, behavioral, and psychographic variables, we classify the segments via decision trees
- Can compare hundreds of variables and their interactions automatically
- Obtain combinations to describe segments
- May have multiple descriptions for one segment

Conclusions

- Machine learning provides new tools and improves existing techniques for consumer insights
- It is now possible to find multiple characterizations for consumer segments in terms of psychographic, demographic, and behavioral data
- These characterizations can be used to guide marketing, product development, and future research



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Thank you very much for your attention

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