QA: Potpourri

Michael Hilton



Administrivia

- Homework 5 released
- https://cmu-313.github.io/homeworks/Homework5.pdf
- Visitor Today!



Jupyter	Jupter notedos support. Interactive programming and computing that supports Intellise debuning and more.
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Overview	Version History Q & A Rating & Review
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A visual Studio C Introducing th We're excited Visual Studio (& devblogs.m :37 PM · Nov 1	e Jupyter Extension for VS Code Python to announce that we're releasing the new Jupyter extension for Code today! The Jupyter extension is the latest step in our icrosoft.com 1, 2020 · Twitter Web App





Activity

Consider the different approaches to fairness. Can you come up with different scenarios where each fairness approach might be appropriate?

Remember the fairness approaches are:

- Group unaware
- Group thresholds
- Demographic parity
- Equal opportunity
- Equal accuracy

Activity Results:

- Group unaware
 - Chess game, Froyo, Admissions, Translation (Languages)
- Group thresholds
 - Hackathons, Medical Systems, Disease Classification, Life expectancy, Admissions, Academic testing
- Demographic parity
 - State (e.g. PA, CA) level decisions, Credit score, Admissions, Hiring
- Equal opportunity
 - o Employment, Admissions, Bail, Taxation, Job Promotion

Trust Calibration

 As a team, brainstorm what kinds of experiences and interactions would decrease, maintain, or inflate trust in your feature's AI. Identify the underlying data sources, system data and user knowledge, that could impact the calibration.



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How to build trust

- Help users calibrate their trust
 - Articulate data sources
 - Tie explanations to user actions
 - Account for situational stakes
- Optimize for understanding
- Manage influence on user decisions



Explanation Strategy

	High				
	•	User should trust AI's decision with minimal explanation Implicit explanation No explanation	•	User should always verify Al's decision Explicit explanation Uncertainty display	
User impact					
	Low				High
	•	User should help teach Al Uncertainty display Implicit explanation		User should always verify Al's decision Explicit explanation Uncertainty display Complete explanation	

Low

Confidence of Al



#DisneyPlus

Celebrating 1 Year. Happy #Plusiversary
Promoted by Disney+

Disney+ Lessons learned

Disney says its new Disney+ streaming service is so popular you can't stream it

"The consumer demand for Disney+ has exceeded our highest expectations." Translation: Whoops.

By Peter Kafka | Nov 12, 2019, 12:30pm EST





A scene from The Mandalorian, a new Star War series streaming on Disney+. | Lucasfilm



Decision Making/ Tradeoffs

Life is all about tradeoffs

In this course, we have talked a lot about tradeoffs.

Some tradeoffs we have discussed:

Writing Tests vs writing more features

Choosing a familiar tech stack vs a "trendy one"

Other tradeoffs...?



Think about structured ways to make decisions

Do what is ethical, legal, moral, obvious

Sometimes, there are multiple (legitimate) options, that all seem to have positives and negatives.

What to do?



People have studied this before...

Economics

Biology + Microbiology

Sociology

Engineering

Computer Science

Strategy Games

Ethics Medicine Politics



Architecture Tradeoff Analysis Method

- 1. Present the ATAM.
- 2. Present business drivers.
- 3. Present architecture.
- 4. Identify architectural approaches.
- 5. Generate quality attribute utility tree.
- 6. Analyze architectural approaches.
- 7. Brainstorm and prioritize scenarios.
- 8. Analyze architectural approaches.
- 9. Present results.



https://concisesoftware.com/architecture-tradeoff-analysis-method-atam/



Pros and cons

THE PROS & CONS of MAKING A PROS & CONS LIST PROS CONS LISTS ARE FUN! CLEVER WAY : of RATIONALIZING MAKES YOU APPEAR A BAD DECISION THOUGHT ful & DELIBERATE GREAT PRACTICE AT DRAWING STRAIGHT LINES -THE OATHEAL

institute for SOFTWARE RESEARCH Carnegie Mellon University School of Computer Science

<u> https://theoatmeal.com/blog/pros_cons_list</u>

Moral or Prudential Algebra

- 1. Make a list of Pros and Cons
- 2. Take a few days to think, forcing your brain to come up with all of the positive and negative aspects of taking the measure you're considering.
- 3. Assign weights to each item on your list depending on its importance.
- 4. When the weight of a item on your "pro" list is equal to the weight of an item on your "con" list, strike both of them out.
- 5. What is left in the balance is the choice you need to make.
- Wait a few more days and, if nothing new occurs to you, act on the decision you've made.





Even Swaps

Premise:

It is easy to make decisions when there is only one objective.

But having only one objective, as any decision maker knows, is a rare luxury.

Even swaps provides a practical way of making trade-offs among any set of objectives across a range of alternatives.

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Overview - 3 step process

1. Create a Consequences Table

2. Eliminate "Dominated" Alternatives

3. Make Even Swaps



Running Example from research paper

Example: Alan Miller is a computer scientist who started a technical consulting practice three years ago.

For the first year, he worked out of his home, but as his business grew he decided to sign a two-year lease on some space in the Pierpoint office park.

Now that lease is about to expire. He needs to decide whether to renew it or move to a new location.



Define the objectives

Alan defines five overriding objectives that he needs his office to fulfill:

- 1. a short commute from home
- 2. good access to his clients
- 3. good office services (clerical assistance, copiers and fax machines, and mail service)
- 4. sufficient space
- 5. low costs

He finds five viable alternatives: Parkway, Lombard, Baranov, Montana, and his current building, the Pierpoint.

Create Consequences Table

MILLER'S CONSEQUENCES TAE

Alternatives					
Objectives	Parkway	Lombard	Baranov	Montana	Pierpoint
COMMUTE IN MINUTES	45	25	20	25	30
CUSTOMER ACCESS (%)	50	80	70	85	75
OFFICE SERVICES	A	В	c	A	с
OFFICE SIZE (SQUARE FEET)	800	700	500	950	700
MONTHLY COST (\$)	1850	1700	1500	1900	1750

https://hbr.org/1998/03/even-swaps-a-rational-method-for-making-trade-offs



Eliminate "Dominated" Alternatives





Make Even Swaps

- 1. Determine the change necessary to cancel out an objective.
- 2. Assess what change in another objective would compensate for the needed change.
- 3. Make the even swap.
- 4. Cancel out the now-irrelevant objective.
- 5. Select the dominant alternative.



First Even Swaps

MILLER'S EVEN SWAPS 1

Alternatives					
Objectives	Lombard	Baranov	Montana		
COMMUTE IN MINUTES	-25	<u>2Q 25</u>	-25		
CUSTOMER ACCESS (%)	80	7Q 78	85		
OFFICE SERVICES	В	с	A		
OFFICE SIZE (SQUARE FEET)	700	500	950		
MONTHLY COST (\$)	1700	1500	1900		



Second Even Swaps





Final Swap







Advice for swaps

- Make the easier swaps first
- Concentrate on the amount of the swap, not on the apparent importance of the overall objective.
- Remember that the value of an incremental change depends on what you start with.
- Make consistent swaps.
- Seek out solid information.



Guest Speaker

Matt Ranney



