A presentation on

DESIGN WITH THE MIND IN MIND CH. 12 HUMAN DECISION MAKING IS RARELY RATIONAL

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DECISION-MAKING THEORY

- Economists and decision theorists decide how humans *ought* to make decisions, not how humans *actually* make decisions.

TWO MINDS

System one: automatic, unconscious, unmonitored, highly parallel, irrational, approximate, fast

System two: controlled, conscious, monitored, single-process, rational, precise, slow

SCENARIO #1

- Choose between the following:
- A) A 50% chance of winning $100.
- B) Guaranteed $45.

SCENARIO #2

- A rich friend proposes to you this bet based on a coin toss.
- If **heads**: they pay you **$150**.
- *However,*
- If **tails**, you pay them **$100**.
- Would you take this bet?

LOSSES MEAN TO US MORE THAN GAINS

- Scenario #1: option A is the rational option.

- Scenario #2: taking the bet is the rational option.

FOUR-FOLD PATTERN

	Gain	Loss
High probability	Gamble: 95% chance to win $10,000 (5% chance to win $0) Alternative: definite gain of $8,000 (less than expected value of gamble) • Fear to lose gain • People are risk-averse • Most accept "safe" definite gain	Gamble: 95% chance to lose $10,000 (5% chance to lose $0) Alternative: definite loss of $8,000 (less than expected loss of gamble) • Hope to avoid loss • People are risk-seeking • Most prefer to gamble
Low probability	Gamble: 5% chance to win $10,000 (95% chance to win $0) Alternative: definite gain of $2,000 (more than expected value of gamble) • Hope for large gain • People are risk-seeking • Most prefer to gamble	Gamble: 5% chance to lose $10,000 (95% chance to lose $0) Alternative: definite loss of $2,000 (more than expected loss of gamble) • Fear of large loss • People are risk-averse • Most accept "safe" definite loss

SCENARIO #3

- Imagine your doctor informs you that you have a terminal disease. She also tells you that you have a 90% survival rate.
- She also could have said that you have a 10% mortality rate.
- How would you feel about each statement?

WE ARE BIASED BY HOW CHOICES ARE WORDED

- Rational agents are not affected by equivalent statements.
- Humans are affected by words (using system one).
- Framing effect: how choices are framed affect people's decisions.
- Framing effect can be very powerful.

WE ARE BIASED BY OUR VIVID IMAGINATIONS AND MEMORIES

- We give more weight to things that we can easily picture or recall. (triggers system one)
- More weight is given to coherent, compelling stories than to statistical evidence.
- System one does not care about sample sizes. Percentages mean the same regardless.

HOW CAN WE (AS DESIGNERS) EXPLOIT THESE CONCEPTS?

- Support rational decision making.
- Data visualization
- Convincing and persuading
- Computer security

SUPPORT RATIONAL DECISION MAKING

- Computers are good at doing things at humans are bad at.
- They support us in calculating, remembering, searching, etc.. Decision making is one of those activities.
- Software used to support complex decisions (where to drill oil, how much water to store in a dam, etc..) is categorized as Decision Support Systems.

DECISION SUPPORT SYSTEMS

- Provide all options
- Help people find alternative
- Provide unbiased data
- Don’t make people calculate
- Check assertions and assumptions

DATA VISUALIZATION

- Exploits system one to help system two.
- Is a way to employ automatic visual perception processes built into system one to help system two understand complex data.
- Graphs, maps, charts, etc..;.

CONVINCING AND PERSUADING

- Persuasion exploits system one.
- Instead of presenting rational arguments and statistics to support their argument, professional advertisers and political copywriters design their messages to portray strong emotions to communicate with their audience's system one.
- Software and web designers do the same thing and even has a dedicated field called persuasive software.

COMPUTER SECURITY

- Low probability of a large loss.
- People tend to play it safe.
- 17% of PCs worldwide have no virus protection. (2012)
- Designers: how can we design computer and smartphone security (data backup, virus protection, etc.) to get more people to use it?
- Security companies ought to rely less on statistics and more on persuasive stories.

THE END

QUESTIONS?