# **Fundamentals of Data Analysis – Topic 8**

## Judgment under Uncertainty: Heuristics and Biases - notes

* “the uncertainty of the world”, stochastic processes in the world
* Things aren't guaranteed to happen, but we can observe trends.
* Opposite to deterministic
* Biased - a calculation that underestimates or overestimates the data.
* Contriving situations where humans make the wrong choice
* Heuristics - hard and fast rules you can make a decision with
  + 999 x 99 instead: 1000 x 100 is an easier estimate.
* Don’t have time for analysis.
  + Bear attack - is the bear old or young? Defending his territory? etc.
* Beliefs concerning likelihood of uncertain events.
  + Expressed in statements such as “I think that…”
  + “Chances are…”
  + “It's unlikely that…”
* Sometimes expressed using numerical form “1 in 20 chance of that” etc.
* This article shows people only rely on a few heuristic principles when making these judgements.
* These principles reduce the complex task of assessing probabilities and predicting values to simpler judgemental operations.
* These heuristics are useful, but sometimes lead to severe and systematic errors.
* Example: guessing someone's occupation based some small description of them, and whether they fit the stereotype of that occupation in your mind.
  + One internally asks themselves “how well does this person represent my idea of things i already know.” In this case, different occupations.
* One major factor we should but do not consider, is the number of people in certain occupations.
  + I.e There's much less librarians than there are farmers, the person is statistically much more likely to be a farmer.
* In a vacuum you would likely pick whatever the most common job is, but the small talk primed you to make another choice.
* In summary, you can make bad decisions based on how representative you think things are.
* Worth being aware of.
* When Should and shouldn't you trust your intuition?
  + Factors such as past experience and consequences
  + E.g is a expert tells you something that goes against the data etc
* When asked for an in depth judgement about something.
  + People tend to overestimate things that easily come to mind.
    - E.g How many/How few billionaires there are.
      * People tend to overestimate due to their constant exposure to them. (from news etc)
    - E.g How many homeless people are there?
      * Underestimate if there aren't many in your vicinity.
* Two systems for thinking about things:
  + System 1: snap decision, first thing that comes into head style
  + System 2: Does not come to head immediately, but you know you can get it (large mathematical calculation)