Lecture 4, Sep 17, 2021

Requirements Continued

- Problem with constraints: hard to justify (e.g. price under \$15 – what happens when the price is \$15.25?)
  - Possibly justified by the stakeholder (e.g. the person only has \$15), but most often hard to justify because it's somewhat arbitrary
  - In this case, we want a *criterion* instead (e.g. cheaper is better)
- Binary metrics are either yes/no (e.g. above zero/below zero); could also be hard to justify
- When objectives are too complex, it is hard to create metrics and criteria
- Requirements should be continuously refined as the project continues and we get more information
- Engineers need to balance the theoretical ideal and practical reality so that it works for you and is **accepted by your peers**
- Criterion define the relationship between a metric and utility ("goodness"), because for some metrics this relationship can be complicated (a utility curve: linear, parabolic, stepwise, etc)
  - A cut-off in the utility-characteristic graph is basically a constraint
  - Should: Cut-off with tolerance; requires justification
  - Must: Hard cut-off

Logic of Converging

1. Metrics: Need a way to differentiate between things before anything
2. Constraints: If the option is to be thrown away, no need to evaluate it any further
3. Criteria: Compare the remaining option to choose the best one

In the end, the conclusion may be that the constraints are too tight and ruled out all the good options, in which case the constraints may be problematic.