Reducing Estimation Uncertainty with Continuous Assessment: Tracking the “Cone of Uncertainty”

The Problem
There are no tools or frameworks to quickly monitor the project’s progression within the cone of uncertainty to allow the necessary adjustments of the effort estimations.

This poster describes the framework we have developed and used to address the following problems:
- Imprecise project scoping
- Project estimations are not often revisited
- Manual assessments are tedious
- Limitations in software cost estimation

The Simulation
- 2 projects from USC’s software engineering course
- Chosen for their similarities in project types, sizes, and complexities.
- Retrieved source code data from Subversion configuration management server
- Both teams were closely involved in the simulation process to appropriately adjust the COCOMO II parameters.

Observations
Both teams demonstrated the same phenomenon where the gaps in the “cone of uncertainty” in effort estimation decreases throughout the project lifecycle and converges at the end of the project.

Future Plans
- Develop tool to fully support the framework
- Determine the frequencies of the assessment that yields optimal results – the sweet spot.
- Experiment on projects of larger scales and different types to observe the prediction accuracy.
- Use concept of value-based by applying weights to the calculation of each module based on

The Model
\[ PM_{NS} = A \times \text{Size}^{0.7} \times \prod_{i=1}^{n} E \times M_i \]
\[ E = 0.91 + 0.01 \times \sum_{j=1}^{5} SF_j \]

References