

Abstract: Multi-dimensional goals are usually formalized in so-called quality models. In general, the qualities of each dimension, the metrics, are not comparable; they come with different units, scale types and distributions of values. Moreover, distribution of metrics is usually skewed, hence popular aggregation methods such as weighted mean, median, e.t.c. cannot be used. Merging them in an ad-hoc manner leads to unsound quality models that are hard to interpret. Aggregators need to be exact and unambiguous, should provide an evidence for decision making. Decisions should be appropriate with intuitive reasoning, expert knowledge and common sense based on mathematical grounds in order to remove uncertainty and subjectivity.

We will start with a short overview of current state of aggregation methods. Then, we will discuss requirements for aggregator both in terms of decision-making and mathematical foundations. Finally, I will show why popular aggregation methods do not fulfill the requirements. At the end of the talk, I will present a mathematically sound way of defining quality models based on joint probabilities allowing for a simple interpretation.

The talk will be mostly oriented for researchers in Software Engineering, however, theoretical part could be interesting to computer scientists and mathematicians as well. Proposed method could be easily applied for aggregation of any type of data which could be interesting for those who use quantitative methods in a research.

Bio: Maria Ulan is a PhD student at Linnaeus university (Växjö & Kalmar, Sweden). Her forthcoming thesis will be about Theoretical Foundations of (Software) Quality Models. Currently she is focused on so-called aggregation problems. In simple words, she is trying to find can one merge different metrics in a single measure. Would such measure make sense?