



## A Rational Foundation for Software Metrology

Much software research and practice involves ostensible measurements of software, yet little progress has been made on an SI-like metrological foundation for those measurements since the work of Gray, Hogan, et al. in 1996 to 2001. Given a physical object, one can determine physical properties using measurement principles and express measured values using standard quantities that have concrete realizations. In contrast, most software metrics are simple counts that are used as indicators of complex, abstract qualities.

In this report NIST has revisited software metrology from two directions: first, top down, to establish a theory of software measurement; second, bottom up, to identify specific purposes for which software measurements are needed, quantifiable properties of software, relevant units, and objects of measurement. Although there are structural obstacles to realizing the vision of software metrology that works like physical metrology for all desired measurands, progress is possible if we start with a rational foundation.

The attached zip file includes:

- Intro Page.pdf
- Terms and Conditions.pdf
- Software Metrology.pdf