Bringing mathematical and physical manuscripts to the net

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Abstract

Proposal for a joint task force/project of the Dibner Institute and the Max Planck Institute for the History of Science.

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1 Starting point

Both institutes aim to bring a.s.a.p. mathematical papers into the net, i.e. Albert Einstein's Zurich Notebook by the MPIWG and Manuscripts of Newton and contemporaries by the Dibner Institute. Furthermore these projects shall be realized without substantial external funding. Therefore a strategy for using already existing technology has to be found which also includes an optimal devision of labor.

The problem of presenting images and (pure) text is to great extent solved. But an open question is how to adequately represent formulae.

2 Overall goal

The overall goal of the project/task force to develop a.s.a p. an environment for presenting mathematical and physical manuscripts in the net. In particular a solution for the representation of formulae in the historic context should be found. The developments shall base on existing technologies already developed at the participating institutes and otherwise available open source technologies.

3 Goals

In detail in a first step (pragmatic) answers to the following questions should be found:

- Which technologies exists for presenting formulae in the net?

- Which standards for encoding formulae as XML exists and can they be used for representing formulae in historic papers in the net?

- Which extensions of existing standards have to be made to represent the semantic meaning of formulae in historical documents?

The answers should be oriented on the need to find a solutions which can on the one hand be realized very soon with existing standards and which are on the other hand open enough for further developments and specifications.

A second step shall be the implementation of a first prototype.

4 First concrete steps

A (real) workshop should be held with a limited number of participants (up to 10) dedicated to the above mentioned questions bringing to together:

- experts on the manuscripts (George Smith, Jürgen Renn)

- experts on representing (modern) mathematical papers (Living Review staff?)

- experts on computer algebra (Mupad, Maple or Mathematica staff, Bruno Buchberger? (risc))

- experts for representing texts (Malcolm Hyman/ Mark Schiefsky (Harvard)).

At the end of the workshop a (pragmatic) working grammar for encoding formulae should be defined and a list of requirements for the needed developments should be made.

5 Division of labor

The MPIWG will further develop their existing presentation techniques and text tools and bring this in the cooperation and cooperate in the new developments.

The Dibner Institute will focus on the evaluation of representing the mathematical parts of the papers. For the first step one (engaged) student with background on history of science and IT may be sufficient.