P1788

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Type of Project: New IEEE Standard
PAR Request Date: 30-Apr-2008
PAR Approval Date: 12-Jun-2008
PAR Expiration Date: 31-Dec-2012
Status: PAR for a New IEEE Standard

1.1 Project Number: P1788
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Title: Standard for Interval Arithmetic

3.1 Working Group: Working Group for Interval Arithmetic (C/MSC/Interval Arithmetic)
Contact Information for Working Group Chair
  Name: Nathalie Revol
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  Name: Ralph Kearfott
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3.2 Sponsoring Society and Committee: IEEE Computer Society/Microprocessor Standards Committee (C/MSC)
Contact Information for Sponsor Chair
  Name: James Davis
  Email: bob@scsi.com
  Phone: 408-353-2706/408-857-1273 Cell
Contact Information for Standards Representative
None

4.1 Type of Ballot: Individual
4.2 Expected Date of Submission for Initial Sponsor Ballot: 06/2011
4.3 Projected Completion Date for Submittal to RevCom: 12/2011

5.1 Approximate number of people expected to work on this project: 50
5.2 Scope: This standard specifies basic interval arithmetic (IA) operations
selecting and following one of the commonly used mathematical
interval models. This standard supports the IEEE-754/2008 floating point types of practical use in interval computations. Exception conditions will be
defined and standard handling of these conditions will be specified.
Consistency with the model is tempered with practical considerations
based on input from representatives of vendors and owners of existing systems.

The standard provides a layer between the hardware and the programming
language levels. It does not mandate that any operations be implemented in hardware.
It does not define any realization of the basic operations as functions in a
programming language.

5.3 Is the completion of this standard dependent upon the completion of another standard: No
5.4 Purpose: The standard will improve the availability of reliable computing in
modern hardware and software environments by defining the basic building
blocks needed for performing interval arithmetic. There are presently
many systems for interval arithmetic in use, and lack of a standard
inhibits development, portability, and ability to verify correctness of codes.

5.5 Need for the Project: There is presently no defined standard, although there are many
systems in use today. However, due to the nature of applications
of interval arithmetic in providing automatic verification,
simplicity, predictability, and portability are doubly
important in the underlying computations. The standard will provide
the necessary ease of implementation, portability, and ability to check
correctness of codes.
5.6 Stakeholders for the Standard: Stakeholders are all users, commercial, research and academic, that
depend on interval arithmetic to perform the required computations...

Intellectual Property
6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board? Yes
If yes, state date: 04/27/2008
6.1.b. Is the Sponsor aware of any copyright permissions needed for this project? No
6.1.c. Is the Sponsor aware of possible registration activity related to this project? No

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7.1 Are there other standards or projects with a similar scope? No
7.2 International Activities
  a. Adoption
  Is there potential for this standard (in part or in whole) to be adopted by another national, regional or international organization? Yes
    Organization: ISO/IEC JTC1
    Technical Committee Name:
    Technical Committee Number: SC22 WG21
    Contact Person Name:
    Contact Person Phone:
    Contact Person Email:
  b. Joint Development
  Is it the intent to develop this document jointly with another organization? No
  c. Harmonization
  Are you aware of another organization that may be interested in portions of this document in their standardization development efforts? No

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8.1 Additional Explanatory Notes (Item Number and Explanation): 1- The ISO/IEC JTC1/SC25/WG4 is also concerned by the standardization of interval arithmetic.
The full name of this working group is "Microprocessor Systems and Interconnection of
Computer Systems and Attached Equipment".