P1855

Submitter Email: rkozma@memphis.edu
Type of Project: Revision to IEEE Standard 1855-2016
Project Request Type: Initiation / Revision
PAR Request Date: 10 Dec 2020
PAR Approval Date: 10 Feb 2021
PAR Expiration Date: 31 Dec 2025
PAR Status: Active
Root Project: 1855-2016

1.1 Project Number: P1855
1.2 Type of Document: Standard
1.3 Life Cycle: Full Use

2.1 Project Title: Standard for Fuzzy Markup Language
Change to Title: ~~IEEE~~ Standard for Fuzzy Markup Language

3.1 Working Group: Fuzzy Markup Language Working Group(CIS/SC/FML-WG)
3.1.1 Contact Information for Working Group Chair:
Name: Giovanni Acampora
Email Address: giovanni.acampora@unina.it
3.1.2 Contact Information for Working Group Vice Chair:
Name: Bruno DiStefano
Email Address: bruno.distefano@gmail.com
3.2 Society and Committee: IEEE Computational Intelligence Society/Standards Committee(CIS/SC)
3.2.1 Contact Information for Standards Committee Chair:
Name: Robert Kozma
Email Address: rkozma@memphis.edu
3.2.2 Contact Information for Standards Committee Vice Chair:
None
3.2.3 Contact Information for Standards Representative:
None

4.1 Type of Ballot: Individual
4.2 Expected Date of submission of draft to the IEEE SA for Initial Standards Committee Ballot: Mar 2023
4.3 Projected Completion Date for Submittal to RevCom: Sep 2023

5.1 Approximate number of people expected to be actively involved in the development of this project: 30
5.2 Scope of proposed standard: This standard defines an eXtensible Markup Language (XML)-based language, named Fuzzy Markup Language (FML), aimed at providing a unified and well-defined representation of Fuzzy Logic Systems (FLSs). This standard includes an extendable schema that natively defines the basic components of an FLS and enables the modeling of different categories of fuzzy inference engines.
Change to scope of proposed standard: This standard defines an eXtensible Markup Language (XML)-based language, named Fuzzy Markup Language (FML), aimed at providing a unified and well-defined representation of Fuzzy Logic Systems (FLSs). This standard includes an extendable schema that natively defines the basic components of an FLS and enables the modeling of different categories of fuzzy inference engines~~, including Mamdani [B16], Tsukamoto [B21], Takagi-Sugeno-Kang (TSK) [B20], and AnYa [B5]~~ .

5.3 Is the completion of this standard contingent upon the completion of another standard? No
5.4 Purpose: This standard allows for the creation of interoperable FLSs. This standard uses the W3C XML Schema Definition (XSD) language as the encoder, which allows for interoperability and the exchange of XML-based FLS instances between various systems. Different from other approaches used to describe fuzzy systems such as Fuzzy Control Language (FCL), FML allows fuzzy designers to simply code their ideas on heterogeneous hardware without need for a deep understanding of details related to the different platforms. This approach enables fuzzy systems designers to achieve design transparency. It means that, by using FML, it is possible to implement the same FLS on different hardware architectures with minimal effort and without additional design and implementation steps. In short, FML makes it possible to model an FLS in a human-readable and hardware-independent way.

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5.5 Need for the Project: The main need for the project is related to initiate a revision activity aimed at addressing significant technology changes that have occurred since the publication of the Standard, so as to extend the capability of researchers and practitioners in using the proposed technology.

Change to Need for the Project: ~~Currently,~~ The ~~engineers~~ main ~~and~~ need ~~scientists~~ for ~~developing~~ the ~~a fuzzy~~ project ~~logic controller progress iteratively by alternating design,~~ is ~~modeling~~ related ~~and~~ to ~~simulation~~ initiate ~~of~~ a ~~their~~ revision ~~controller.~~ activity ~~Depending~~ aimed ~~on~~ at ~~several~~ addressing ~~design~~ significant ~~design~~ technology ~~parameters,~~ changes ~~parts of this process are better handled by some software tool while some others are better handled by other software tools. Unfortunately, designers often~~ that have ~~to~~ occurred ~~enter~~ since ~~manually~~ the ~~various versions~~ publication of ~~their model into several software packages. Fuzzy Logic~~ the Standard ~~IEC 1131-7~~ , ~~was~~ so ~~meant~~ as to ~~address this issue and allow interoperability of various software packeges. This has not happened mainly because of~~ extend the ~~lack~~ capability of ~~power of the abstractions of IEC 1131-7. The proposed standard is meant to address this need~~ researchers and ~~to result~~ practitioners in ~~more~~ using ~~powerful~~ the ~~software~~ proposed ~~tools~~ technology .

5.6 Stakeholders for the Standard: Engineers and scientists developing fuzzy logic controllers and software developers producing add-on software packages for fuzzy logic design tools.

6.1 Intellectual Property

6.1.1 Is the Standards Committee aware of any copyright permissions needed for this project?
No

6.1.2 Is the Standards Committee aware of possible registration activity related to this project?
No

7.1 Are there other standards or projects with a similar scope? Yes

Explanation: IEC 1131-7 CD 1 is the only standard dealing with a formal description of fuzzy inference engines. However, it is very limited in scope.

7.1.1 Standards Committee Organization: International Electrotechnical Commission (IEC)

Project/Standard Number: IEC 1131-7 CD 1

Project/Standard Date: 01 Jan 1997

Project/Standard Title: IEC 1131 - PROGRAMMABLE CONTROLLERS
Part 7 - Fuzzy Control Programming

7.2 Is it the intent to develop this document jointly with another organization? No

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8.1 Additional Explanatory Notes: