

A Special Issue in  
**IEEE/CAA Journal of Automatica Sinica**  
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Special Issue Title  
“Fractional Order Systems and Controls”

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Fractional calculus is about differentiation and integration of non-integer orders. Using integer-order models and controllers for complex natural or man-made systems is simply for our own convenience while the nature runs in a fractional order dynamical way. Using integer order traditional tools for modelling and control of dynamic systems may result in suboptimum performance, that is, using fractional order calculus tools, we could be “*more optimal*” as already documented in the literature. An interesting remark is that, using integer order traditional tools, more and more “anomalous” phenomena are being reported or perhaps complained but in applied fractional calculus community, it is now more widely accepted that “*Anomalous is normal*” in nature. We believe, beneficial uses of fractional calculus from an engineering point of view are possible and important. We also hope that fractional calculus might become an enabler for new science discoveries. Bruce J. West just finished a new book entitled “The Fractional Dynamic View of Complexity - Tomorrow’s Science” (CRC Press, late 2015). We resonate that, with this special issue, “Fractional Order Systems and Controls” will one day enable “tomorrow’s sciences”.

Since 2012, several special issues were published in some leading journals which

showcase the active interference of fractional calculus to control engineering. Clearly, there is a strong need to have a special issue in an emerging leading control journal such as IEEE/CAA Journal of Automatica Sinica (JAS). This focused special issue on control theory and applications is yet another effort to bring forward the latest updates from the applied fractional calculus community. For that we feel very excited and we hope the readers will feel the same.

The aim of this special issue is to show the control engineering research community the usefulness of the fractional order tools from signals to systems to controls. It is our sincere hope that this special issue will become a milestone of a significant trend in the future development of classical and modern control theory. The contributions may stimulate future industrial applications of the fractional order control leading to simpler, more economical, more energy efficient, more reliable and versatile systems with increasing complexities.

There is no doubt that with this special issue, the emerging concepts of fractional calculus will have their mathematical abstractness removed and become an attractive tool in the field of control engineering with more “good consequences”. We welcome any contribution within the general scope of the Special Issue theme “Fractional Order Systems and Controls”.

#### **IMPORTANT DATES: (tentative)**

|                   |                    |
|-------------------|--------------------|
| 15 June 2015:     | Call for Papers    |
| 31 August 2015:   | Paper Submission   |
| 31 October 2015:  | First Review       |
| 30 November 2015: | Paper Acceptance   |
| Issue #1 of 2016: | Publication online |

#### **SUBMISSION GUIDELINES:**

Potential authors are encouraged to upload the electronic file of their manuscript through the journal’s online submission website:

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Please select the special issue item on the drop-down menu when you submit papers.

All papers have to be written in English and submitted according to the IEEE/CAA Journal of Automatica Sinica guidelines.