



Welcome to



## TC 3.2.

# “Computational Intelligence in Control”

## Summary

- News from IFAC
- TC 3.2 Position, visibility
- Actions during last years
- Important actions
- Future actions for next years
- Other matters



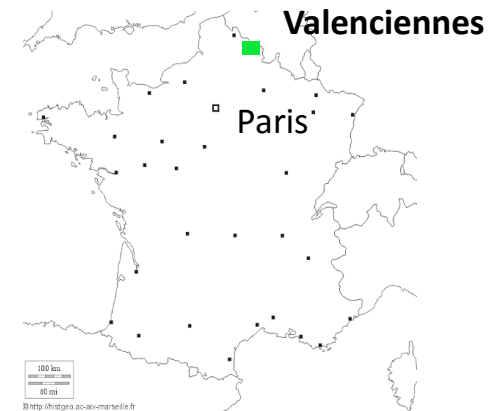
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## TC 3.2.

# “Computational Intelligence in Control”

**Chair: Thierry Marie Guerra**  
(University of Valenciennes, France)



Vice-Chairs:

Sushi Sam Ge  
National Univ  
of Singapore



Frank L. Lewis  
University of Texas  
at Arlington, USA



Antonio E.B. Ruano  
Universidade do Algarve  
Faro, Portugal





# Chairs main topics



Computational Intelligence, Intelligent Control

Robotics, Robot Control, Adaptive (Neural Network) Control, Hybrid Control, and Real-time Implementation.

Automatic Control, Observation, Fuzzy systems and Control, Takagi-Sugeno Fuzzy Models, Hybrid Vehicles, IC Engines, Disabled people

Cooperative Control of Distributed Systems on Graphs

Reinforcement Learning & Approximate Dynamic Programming

Intelligent Nonlinear Control

Neural network control of robots and nonlinear systems

Intelligent Diagnostics and Prognostics

## **Associate Editorship (actual):**

*Automatica, Fuzzy Sets & Systems, IEEE T Fuzzy Systems, IEEE T Vehicular Technology, Journal of Control Theory and Applications, IEEE Control Systems Magazine (for Asia & Australia), Journal of Intelligent and Robotic Systems*



# Goals ...



## Vision

*“...for IFAC to be the worldwide federation for promoting automatic control for the benefit of humankind”*

## Mission

*“...to promote the science and technology of automatic control through technical meetings, publications and other means consistent with the goals and values of IFAC.”*

**2011-14 Ian Craig**  
Pretoria Univ  
South Africa

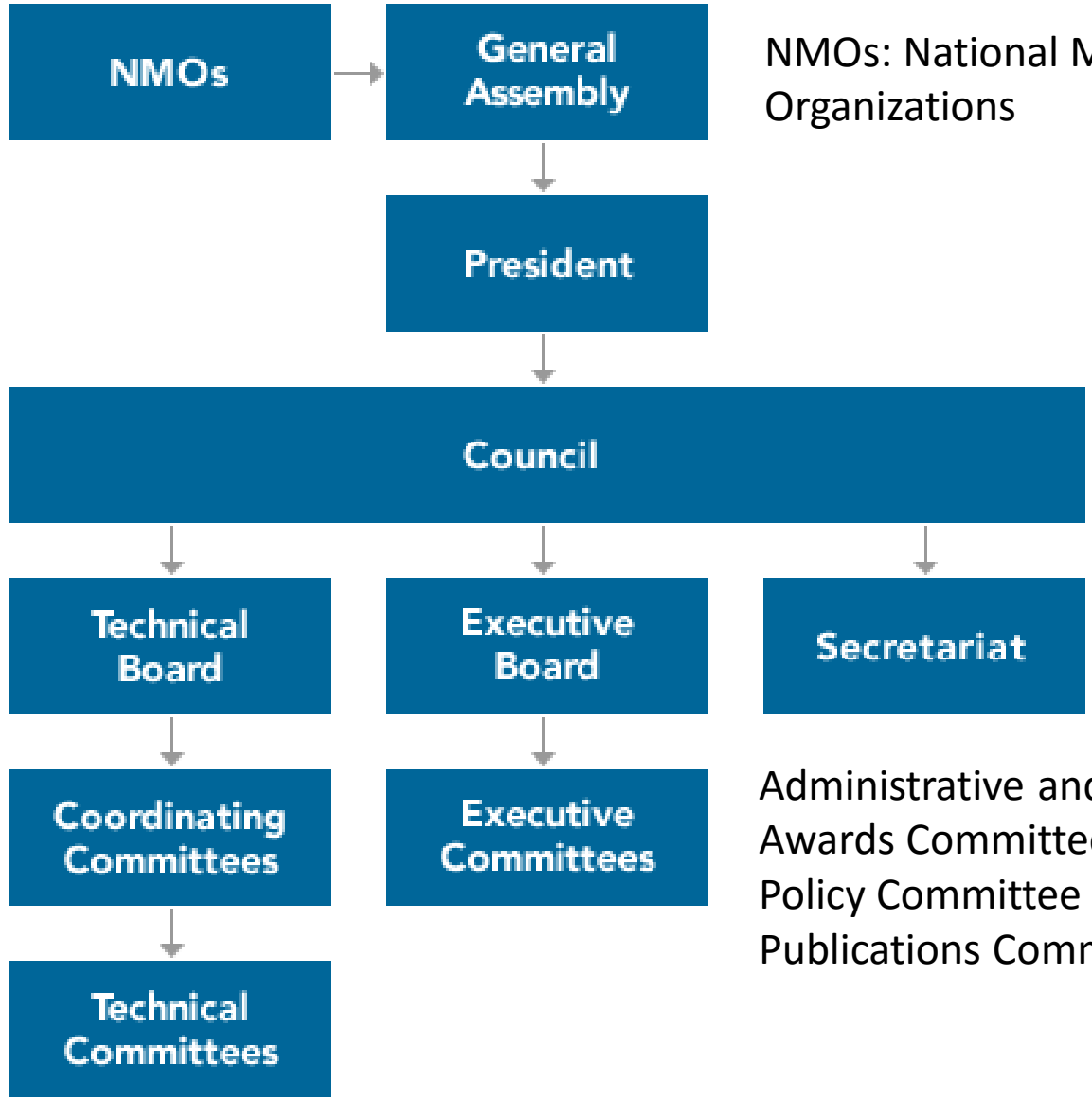


**2014-17 Janan Zaytoon**  
Reims Univ  
France



**2017-20 Frank Allgöwer**  
Stuttgart Univ  
Germany

# Structure



NMOs: National Member Organizations

Administrative and Finance Committee  
 Awards Committee  
 Policy Committee  
 Publications Committee

9

41



# General News



General Website:

<http://www.ifac-control.org/>

TC 3.2:

<http://tc.ifac-control.org/3/2>

## History Channel on YouTube

## New IFAC Medal

In its July 2015 Meeting the IFAC Council has approved the creation of a new major IFAC Medal, to recognize outstanding contributions of a young researcher or engineer to the domain of systems and control. It is directed towards candidates under the age of 40, and will be named after [Manfred Thoma](#), a leading contributor to the field of control and to IFAC, and supporter of the careers of many young scientists.

## IFAC-PapersOnline is now part of ScienceDirect

Annual Reviews in Control, Automatica, Control Engineering Practice, Engineering Appl. Artificial Intelligence, Journal of Process Control, Mechatronics, Nonlinear Analysis: Hybrid Systems







## TC 3.2 Meeting



**CC 3 - Computers, Cognition and Communication (Klaus Schilling, Univ Wuerzburg)**

**TC 3.1. - Computers for Control (Marga Marcos, Univ Bilbao)**

**TC 3.2. - Computational Intelligence in Control (Thierry Marie Guerra)**

**TC 3.3. - Telematics: Control via Communication Networks (Ulrich Jumar, Magdeburg)**



### Major events: how it works





ICONS 2016

Reims Convention Center, France, June 1-3, 2016

# Actual committee

Laurent	Arcese	FRANCE	Tufan	Kumbasar	TURKEY
Robert	Babuska	NETHERLANDS	Kauko	Leiviska	FINLAND
Miguel	Bernal	MEXICO	Zsofia	Lendek	ROMANIA
Saso	Blazic	SLOVENIA	Frank	Lewis	USA
Lucian	Busoniu	ROMANIA	Kang	Li	UNITED KINGDOM
Hui	Cao	CHINA	Benedito Isaias	Lopes	BRAZIL
Wen-Hua	Chen	UNITED KINGDOM	Purnaprajna	Mangsuli	INDIA
Jin Young	Choi	KOREA, REPUBLIC OF	Sean	McLoone	IRELAND
Alok	Deb	INDIA	David	Naso	ITALY
Ioan	Dumitrache	ROMANIA	Ikuko	Nishikawa	JAPAN
Mehmet Onder	Efe	TURKEY	Gülay	Öke Günel	TURKEY
Ibrahim	Eksin	TURKEY	Eduard	Petlenkov	ESTONIA
Abdelkader	El Kamel	FRANCE	Radu-Emil	Precup	ROMANIA
Rogério	Flauzino	BRAZIL	José	Principe	USA
Veysel	Gazi	TURKEY	Beibei	Ren	USA
Shuzhi Sam	Ge	SINGAPORE	Emanuel	Rocha	MEXICO
Bernard	Grabot	FRANCE	Antonio	Ruano	PORTUGAL
Kevin	Guelton	FRANCE	Antonio	Sala	SPAIN
Thierry Marie	Guerra	FRANCE	Matilde	Santos Peñas	SPAIN
Robert F	Harrison	UNITED KINGDOM	Igor	Skrjanc	SLOVENIA
Gareth G.J.	Howells	UNITED KINGDOM	Yazhe	Tang	CHINA
Petr	Husek	CZECH REPUBLIC	M. Osman	Tokhi	UNITED KINGDOM
Sarangapani	Jagannathan	USA	Mustafa	Unel	TURKEY
Snejana	Jordanova	BULGARIA	Tibor	Vamos	HUNGARY
M. Okyay	Kaynak	TURKEY	Mao	Ye	CHINA
Jus	Kocijan	SLOVENIA	Engin	Yesil	TURKEY
Laszlo	Koczy	HUNGARY	Jun	Yoneyama	JAPAN
Petia	Koprinkova-Hristova	BULGARIA	Zhigang	Zeng	CHINA
Zdzislaw	Kowalczyk	POLAND	Huaguang	Zhang	CHINA
Stefan	Kozak	SLOVAKIA	Dongbin	Zhao	CHINA





# Visibility?



## Main Topics 3.2:

A part of Automatic control has been put under the general appellation:

**“intelligent control”**

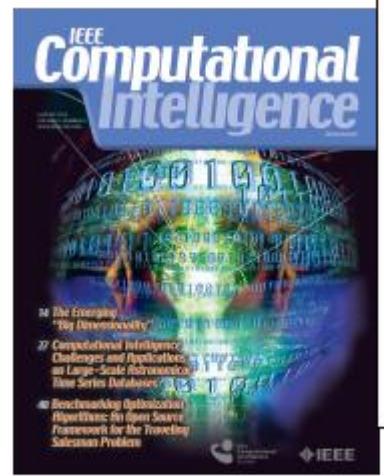
### *Definition?*

TC 3.2: fuzzy, neural (both artificial and biologically plausible), linguistic, fuzzy-neural, evolutionary, reinforcement learning... approaches

- applied to automatic control: identification, forecasting, stability/stabilization analysis, diagnosis, fault detection, design, learning, adaptation, evaluation, definition of performances objectives and operation constraints,
- awareness for computational issues, brain-computer interfacing, bioinformatics and computer-aided design tools.

**Applications:** everywhere...

# Visibility?



CI Mag



TNNLS



TFS



TEVC



TCIAIG



TAMD

**Keywords: "Computational Intelligence" → IEEE**  
**IEEE CIS:** Computational Intelligence Society  
 Problem: larger including Computer Science...

To give you a hint:

We are on **"hot"** topics:  
 IEEE Strategic Research's active research projects asked AE from the area the opportunity (or not) to launch a new transaction in the field!!!



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## Recent actions



The TC 3.2 was highlighted in 2014:



A milestone session organized by A. Ruano in IFAC WC 2014, CapeTown South Africa

+

A.E. Ruano, S.S. Ge, T.M. Guerra, F.L. Lewis, J.C. Principe, M. Colnarič

“Computational intelligence in control”

Annual Reviews in Control (2014) 38 (2), 233-242



**Co-sponsorship**, how does it work?

From IFAC to TC Chair, 1 week for answer yes/no → if yes give some names for the future IPC

→ Wait approval IFAC

→ I apologize for the members I design, I have no time for asking...



# Co-sponsoring



1. 11<sup>th</sup> Symp Robot Control 2015 Brazil August 26-28



2. Sozopol, Bulgaria, September 24-27, 2015



**TECIS '15 - 16th IFAC Conference on Technology, Culture and International Stability**

3. The 7<sup>th</sup> International Joint Conference on Computational Intelligence - IJCCI, Lisbon, Portugal 12-14 November, 2015



4. MIM 2016, June 28-30, 2016, Troyes, France



6. **WOCO 2016**  
IFAC/IFIP Workshop on Computers & Control

7. EUROSIM 2016" Oulu, Finland September 12-15, 2016



8. 4th IFAC Symposium on "Telematics Applications – 4th TA 2016" Porto Alegre - RS, Brazil November 06-09, 2016



9. Norbert Wiener in the 21<sup>st</sup> Century, Melbourne





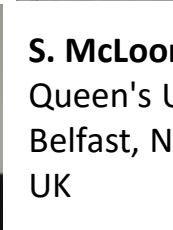


# Important actions



INTERNATIONAL FEDERATION OF AUTOMATIC CONTROL

EAAI (Engineering Applications of Artificial Intelligence): IF 2.207  
 Editor-in-Chief Bernard Grabot (Tarbes) until Dec 2015



**S. McLoone**  
 Queen's University Belfast,  
 Belfast, Northern Ireland,  
 UK

Ajith Abraham  
 Since Jan 2016



AE TC3.2:



Reinforcement connections EAAI ↔ TC 3.2



**Juš Kocijan**  
 Ljubljana, Slovenia

New AE from TC 3.2



**S. Blažič**  
 University of Ljubljana,  
 Slovenia



**K. Guelton**  
 Université de Reims  
 Champagne-Ardenne,  
 France



**B. Ren**  
 Texas Tech University,  
 Texas, USA



**L. Busoniu**  
 Technical University  
 of Cluj-Napoca,  
 Romania



**Z. Lendek**  
 Technical University  
 of Cluj-Napoca,  
 Romania



**M. Ye**  
 University of Electronic  
 Science and  
 Technology of China,  
 China



# Important actions



EAAI (Engineering Applications of Artificial Intelligence): IF 2.207  
Editor-in-Chief

Ajith Abraham  
Since Jan 2016



EAAI (Engineering Applications of Artificial Intelligence): IF 2.207

Special issue based on IFAC ICONS 2016 Reims

Goal: promote EAAI AND TC 3.2





# Important actions



Point and figures for this conference Icons:

**94 initial submissions** from 34 countries

**66 accepted papers** in the technical program from **29 countries**  
(*acceptance rate: 70.2%*)

**82 attendees** (*Registrants + NOC*)

To compare with 2013 Chengdu:

**185 initial submissions** from **51 countries**

**129 accepted papers (123 presented)** in the technical program  
(*acceptance rate: 70%*)

**122 attendees** (*Registrants + NOC*)





# Important (future) actions



IFAC 2017 World Congress, Toulouse, France

The 20th World Congress of the International Federation of Automatic Control, 9-14 July 2017

## Important dates:

Open Invited Track Submission: September 15, 2016 → Min 3

Paper submission deadline: **October 31, 2016**

Workshops, tutorials: November 2016 → Why not?

Authors notifications: February 20, 2016

## Some figures:

IFAC WC, for TC 3.2:



**Crucial and "Mandatory"  
WHO?**

Submitted 29 papers → 18 regular papers (12 acc) + 11 invited session

2 special sessions, 2 regular sessions, 1 milestone session





# Future Proposals



Will be discussed in

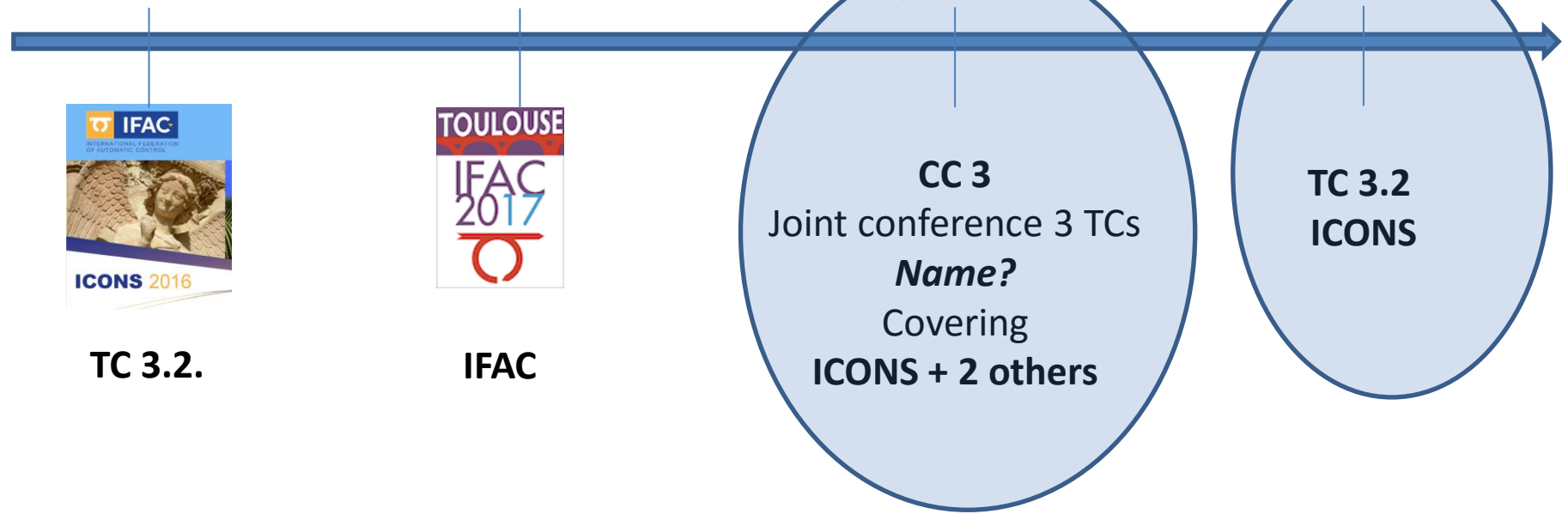


Sean McLoone proposed to host  
ICONS 2019 in the University of  
Belfast, Northern Ireland



Will be discussed in **WOCO 2016**  
IFAC/IFIP Workshop on  
Computers & Control

1 proposal by Antonio Ruano







## As a conclusion...



Visibility has to be reached in IFAC for “Intelligent Control”

Junior affiliation to the TC for PhD students (as proposed in other TC)

### *Communication:*

- reinforcing the Website (any idea, proposal?) → some information (slides from Milestone), soon slides of the meetings
- proposing a newsletter (topics, periodicity?)

**Any additional questions and/or topics?**

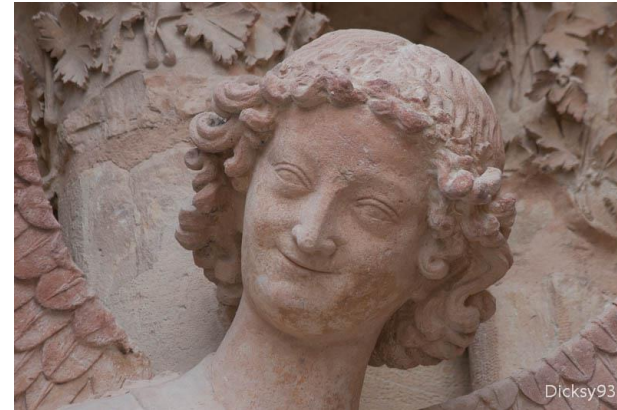


# THANK YOU!!!

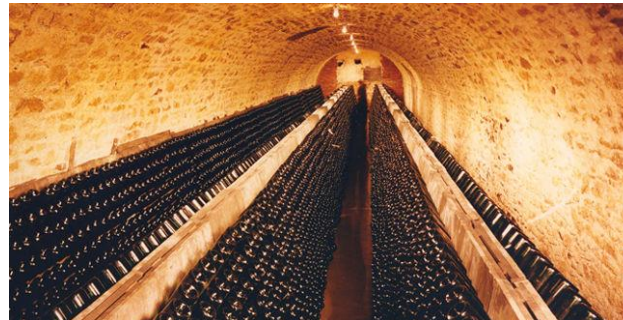


Whatever... Keep calm...

And smiling...



And enjoy your stay...



**With moderation (of course)!!!**