



**Final Report on IAPR TC3
(September 2018 - December 2020)**

December 23, 2020

1. TC Background Information

IAPR TC3 - Neural Networks and Computational Intelligence

1.1. TC Aim and Scope

The IAPR-TC3 is one of the twenty Technical Committees of the International Association for Pattern Recognition (IAPR). The scope of the Technical Committee 3 of IAPR is to constitute a forum and promote research in the areas of artificial neural networks, computational intelligence, and machine learning techniques for pattern recognition. Topics of interest include deep learning, adaptive modeling of sequences and structures (i.e., graphs), probabilistic graphical models, kernel methods, fuzzy systems, evolutionary computing/genetic algorithms, and those branches of statistics that are relevant to these fields. Applications embrace such areas as bioinformatics, cheminformatics, audio & video processing, image classification (including OCR, handwritten text recognition, decision-making in bio-medical imaging), forensics.

While keeping its traditional aims and topics of interest, the TC3 has recently been having a new Manifesto which focuses more on novel, off-the-beaten-track approaches. The Manifesto goes as follows: “Mainstream science is about publishing what everyone else is publishing with very small changes. You’d better at least start off that way if you want to get tenure,” the sociologist Rodney Stark said. But “big ideas don’t come to those who avoid risk”, as John Bohannon added. The area of artificial neural networks and machine learning makes no exception to these ends. Mainstream topics, originally stemming from exciting breakthroughs (the “big ideas”) that gradually become trends and end-up being mostly over-beaten publishing tracks, have characterized the scientific literature throughout the whole history of this research field. Based on these premises, IAPR-TC3 promotes real novel research developments in the areas of neural networks and learning machines that (1) are rooted in (or, aimed at) pattern recognition, and that, above all, (2) do not follow in the footsteps of nowadays established trends.”

1.2 TC Structure and Organization

Chair:

Edmondo Trentin
DIISM
Univ. of Siena (Italy)
trentin@dii.unisi.it

Vice-Chair:

Markus Hagenbuchner
Faculty of Engineering and Information Sciences
Univ. of Wollongong (Australia)
markus@uow.edu.au

Leadership Board:

Amir Atiya
Neamat El Gayar
Simone Marinai
Friedhelm Schwenker

Information Officer:

Andreas Fischer

Newsletter Editor:

Nicola Nobile

1.3 TC website URL

<http://iapr-tc3.diism.unisi.it>

1.4 Number of members (people on mailing list)

196

1.5. Communication means (e.g. newsletters, social media) and frequency

- Regular communications via the “News form the Tcs” in the IAPR Newsletter (quarterly)
- Website
- Mailing list (when needed to announce events)

1.6. Listing of key event(s) typically organized by the TC

Series of IAPR TC3 Workshops on Artificial Neural Networks in Pattern Recognition (ANNPR), hosting the biennial meeting of the TC3.

2. Activities in the last two years (since ICPR 2018)

2.1 September 19-21, 2018: 8th IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2018), Siena, Italy. Proceedings are published by Springer, ISBN 978-3-319-99977-7. (Editors: L. Pancioni, F. Schwenker, and E. Trentin), 58K chapter downloads to date.

2.2 October 2018: publication in the *Neural Processing Letters journal* (Springer) of the Special Issue on “Off the mainstream: advances in neural networks and machine learning for pattern recognition” (as a follow-up of the 7th IAPR TC3 ANNPR, including selected papers plus novel papers in response to an open CFP). Guest Editors: E. Trentin, F. Schwenker, N. El Gayar, and H. M. Abbas.

2.3 2019-2021: editorial process of the TC3-endorsed Special Issue on “Computational Algebraic Topology and Neural Networks in Computer Vision” of the journal *Mathematics*. Guest Editors: Rocio Gonzalez Diaz and Matthias Zeppelzauer.

2.4 September 2nd-4th, 2020: 9th IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2020), Winterthur, Switzerland. Proceedings are published by Springer, ISBN 978-3-030-58308-8. (Editors: Frank-Peter Schilling and Thilo Stadelmann), 4.1k chapter downloads to date.

2.5 Constant TC3 website updates, including new events and new material.

3. Future plans (timeline until ICPR 2022 and beyond):

3.1. Planned activities

- a) Organization of the 10th IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2022).
- b) Completion of the editorial process for the Special Issue on “Computational Algebraic Topology and Neural Networks in Computer Vision” of the journal *Mathematics* (to be published by the end of 2021).
- c) Series of webinars given by well-known fellow scientists on topics that revolve around the TC3 aims, scope, and Manifesto (to start between 2021 and 2022).
- d) New website to be hosted at the new Chair's institution.
- e) Update to the TC3 Leadership Board; new appointments as TC3 Information Officer and TC3 Newsletter & Website Editor.
- f) Regular communications to the IAPR Community of the TC3 news and activities by means of quarterly contributions to the IAPR Newsletter, section “News from the Tcs”.

3.2. Recommendation to ExCo for TC leadership team for 2021-2022 term (TC Chairs cannot serve for more than two terms)

Following the unexpected, last-minute unavailability of the vice-Chair, Dr. Hagenbuchner, to take the Chair for the next term(s), intensive consultations and multiple contacts were carried out, resulting in these recommendations:

- *Recommended Chair:* Prof. **Hazem Mahmoud Abbass**, Faculty of Engineering, Ain Shams University (Cairo , Egypt). Email: hazem.abbas@eng.asu.edu.eg

Prof. Abbas is an established researcher in neural networks and pattern recognition, who has long been a member of the TC3. He gave strong contributions to the TC3 activities by co-organizing the 7th IAPR TC3 Workshop on Artificial Neural Networks in Pattern Recognition (ANNPR 2016) in Ulm (Germany), and by co-editing the aforementioned TC3-endorsed Special Issue on “Off the mainstream: advances in neural networks and machine learning for pattern recognition” of the *Neural Processing Letters* as a follow-up of ANNPR 2016.

- *Recommended Vice-Chair*: Dr. **Mirco Ravanelli**, MILA Lab, University of Montreal (Canada). Email: mirco.ravanelli@gmail.com.

Dr. Ravanelli is a young and brilliant researcher in Yoshua Bengio's team, with a strong publication record. His scientific interests are rooted in deep learning, with applications to speech/speaker recognition. He would bring fresh energies to the TC3, as well as new takes on the fast-evolving area of deep neural networks for pattern recognition. He would be ready to take the TC3 Chair after serving for the forthcoming two terms as a Vice.

- *Recommended Leadership Board*: we recommend the current board is confirmed, and extended to include also the present Chair of the TC3, Edmondo Trentin.

4. Other Comments