

Charter of the Neural Systems, Applications and Technologies (NSAT) Technical Committee (TC) of the IEEE Circuit and Systems Society

June 5, 2023

1 Preamble

The Neural Systems, Applications and Technologies (NSAT) Technical Committee (TC) is a Technical Committee of the IEEE Circuits and Systems Society (CASS). The Neural Systems, Applications and Technologies Technical Committee (NSAT TC) is a subsidiary organization of the IEEE CASS and it is governed by the rules and regulations of the IEEE and by the Constitution and By-Laws of IEEE CASS, which take precedence over this Charter in case of a conflict.

TCs are established by IEEE CASS in significant fields of interest of the Society, through its Technical Activities Division (TAD), to advance the state of knowledge and educate Society members and the general IEEE membership.

To these ends, the NSAT TC plays a major role in creating a high quality technical program for the Society's flagship conference, the International Symposium on Circuits and Systems (ISCAS).

TCs also may organize or contribute to other workshops and conferences, special sessions at conferences, and tutorial programs, and undertake other activities to help better achieve their purpose.

Further, the NSAT TC may act as a bridge between CASS and related IEEE Societies and Councils, and other institutions in the general area of the TC.

2 Purpose

Vision

The vision of this TC is to exploit the principles used by biological neural systems in developing new technologies and computing paradigms that can solve long-standing and challenging engineering problems.

Mission

Our mission is to encourage and support the development of novel and pioneering strategies for solving fundamental and applied problems, by means of circuits and systems that are inspired from biological neural networks. The agenda of the TC mission is defined around the following target areas.

- Emerging learning paradigms.
- Neural systems for big-data problems.
- Implementation of neural circuits systems using emerging device and circuit technologies.
- Physical electronic models of biological neural systems.
- Neural systems for robust, energy efficient sensing and computing.
- Hybrid systems combining biology and neuromorphic technologies.

3 Activities

The NSAT TC activities include:

1. Organizing that part of the technical program of ISCAS related to the NSAT TC field; this includes review of all papers submitted to ISCAS in tracks on topics in the NSAT field (appointing TPC Track Chairs, Review Committee Members [RCMs] and paper reviewers), and arranging Tutorials, Special Sessions, Workshops, Short Courses and other sessions
 - The Chair-Elect will be responsible for organizing Tutorials/Special Sessions/Workshops/Short Courses and other sessions; the Chair is expected to assist.
2. Nominating individuals for (1) Society Awards, (2) Editorial appointments, (3) Distinguished Lecturer appointments, and (4) roles as CASS representatives for Steering and other Committees arising from joint efforts with other Societies and Councils
 - Every Member will be solicited by the Chair-Elect to submit nominations for Society Awards. The Officers jointly will decide from the submissions by the Members, the names to be submitted to each CASS Award Committee.
 - The Committee will accept nominations for Editorial Appointments and review them at the Annual Meeting proceeding the term of the incoming editors. The Chair will be responsible for learning when each Editorial Board is going to form and for soliciting nominations from the Members in a timely manner.
3. Nominating papers for CASS journal Best Paper awards
 - Every Member will be solicited by the Chair-Elect to submit paper nominations. The Officers jointly will decide from the submissions by the Members, the papers to be submitted to each CASS Award Committee.
4. Preparing the TC Annual Report
5. Preparing information for periodic Review of the TC by the Society
6. Maintaining the TC website
7. Reviewing and, if needed, updating the TC Vision & Mission statements at least every 5 years
8. Assessing the quality and helping to maintain/raise the quality of any CASS-sponsored conferences in the field
9. Other activities to help achieve the Purpose, such as editing of reprint books, organizing special issues of an IEEE publication, workshops, conferences, and other publication activities, etc. in the field of NSAT.

4 Membership

Membership of the NSAT Technical Committee (which we shall call the Committee) is open to any IEEE member. Membership is approved by a majority of NSA TC Members (which we shall refer as Members) present at the Committee's Annual Meeting (held during the IEEE International Symposium on Circuits and Systems (ISCAS)) following an informal voting via emails conducted by the Secretary. Membership is by recommendation and by a majority vote of the Members present at the Annual Meeting.

All new Members to be nominated should express their interest to be active Members. A Member is said to be active if he/she either attends the Annual Meeting at least once every 3 years or submits a write-up for inclusion in the Annual Report at least once every 3 years. **If this condition is not satisfied for a member, he/she will be put on Probation.** The Secretary will email to all Members **on Probation** to encourage them to become active Members. A Member **will be termed** inactive if he/she

had never attended the Annual Meeting in the past 5 years and had never submitted any write-up for the Annual Report in the past 5 years. In this case the Member **will be** automatically removed from the Committee. **The Secretary will communicate with the Members on Probation in their fifth year reminding them about the risk of being removed from the TC.**

The TC will maintain and publish annually the TC Roll of Members, including email addresses, a record of attendance at the Annual Meeting and participation in activities.

A subset of the Members of the Committee shall be designated as Regional Representatives, which function as regional contact points for information about the Committee and as coordinators of activities in the field of NSAT within a designated geographical region. Regional Representatives shall be designated each year at the Annual Meeting with no limit on the number of times a Member can serve as a Regional Representative.

5 Duties and Election of the Officers

The Committee shall have four officers: Chair, Chair-Elect, Secretary, and Secretary-Elect. Each will serve a two-year term.

The Chair will preside over an Annual Meeting and be responsible for all interactions with the CASS. With the assistance of the Secretary, the Chair will report the Committee's activities in an Annual Report to the Board of Governors of the CASS. The Chair will also be responsible for recommending Associate Editors in the field of NSAT for various Transactions of the CASS, and for recommending Regional Representatives to be designated in the Annual Meeting. The Chair or his/her designated Member will serve as the NSAT Track Chair in ISCAS if requested.

The Chair-Elect, who must be a Member of the NSAT TC and a Member of the CASS, will be elected by a majority vote from the Members of the Committee present at an Annual Meeting and will serve a four-year term (two years as Chair-Elect and then two year as Chair). The Chair-Elect will be the focal point for processing the nominations of various CASS Awards in the field of NSAT. The Chair-Elect will be responsible for the NSAT TC-sponsored Invited Sessions, Tutorials, and Short Courses at ISCAS. The Chair-Elect will assume the Chair of the Committee after the ISCAS two year following his/her election.

The Secretary-Elect, who must be a Member of the NSAT TC and a member of the CASS, will be elected by a majority vote from the Members of the Committee present at an Annual Meeting and will serve for a four-year term (two years as Secretary-Elect and then two years as Secretary). The Secretary, who will act as the Treasurer for the Committee, will record the minutes of the Annual Meeting and maintain an official list of active Members of the Committee. The Secretary will assist the Chair to prepare an Annual Report on the Committee's activities to the Board of Governors of the CAS Society, and an agenda for the Annual Meeting. The Secretary is responsible to process the nominations of new Members through emails for official approval in the Annual Meeting, and to regularly update and maintain the NSAT TC official web site. Immediately after his/her election, the Secretary-Elect is expected to assist the Secretary to carry out the Secretary's duties.

The Chair and Secretary are normally not directly elected and are filled by transition of the Chair-Elect and Secretary-Elect at the end of their two-year term. An out-of-sequence election for the Chair or Secretary can be held should the Chair-Elect or Secretary-Elect be unable to assume the role of Chair or Secretary.

Outside of an Annual Meeting, the four Officers can, upon a majority vote, undertake unplanned business on behalf of the Committee, provided that these activities will be reported to the Committee at the next Annual Meeting.

6 Meetings and Conduct of Business

The Committee will meet once a year at ISCAS. All business requiring Committee approval will be transacted at this time or by ballot via the internet.

- A meeting quorum is Ceiling function of one third of the TC members attending the meeting.

- A minimum of two weeks notice of any Motions shall be provided to voting members prior to the close of voting to allow members to consider the issues, except as otherwise provided in Clause 7 of this Charter.
- A majority of the legal votes cast by the TC members attending a meeting with a quorum is necessary to approve a motion, except as otherwise provided in Clause 7 of this Charter.
- For internet ballots, voting by a minimum of one-half of the TC members is a valid ballot.
- If a quorum is not reached, tentative actions may be taken which will become effective after subsequent ratification, either by internet ballot or at a subsequent meeting.

7 Charter Amendments

Future amendments will be by a majority vote from the Members present at the Annual Meeting held during the corresponding ISCAS or from the majority of the Members at large through emails. Any amendment can be introduced at the Annual Meeting, provided that at least one of the four Officers has been notified at least one month prior to the Annual Meeting. Approval by the four Officers is not necessary, but notification is required. An approved amendment will take effect the day following the conclusion of the Annual Meeting where it has been officially approved.

Motions to Amend the Charter and to Close (i.e. shut down) the TC have special conditions to be consistent with CASS and IEEE rules. The conditions for such ballots at a meeting and by internet ballot differ:

- Internet Ballot: voting by a minimum of one half of the TC members is a valid ballot; a two-thirds majority is required to pass the Motion;
- Ballot at TC Meeting: a Special Quorum of the Ceiling function of one-half of the TC members at the meeting is required; a two-thirds majority is required to pass the Motion.