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## Editorial

*Dear IEEE Member,*

*This newsletter presents the latest activities from the IEEE Sweden Section and its affiliated chapters. Among the others, you can find an announcement of IEEE Senior Membership campaign, and a call for the establishment of Life Membership Affinity Group in Sweden, and the latest news from the Power & Energy and Power Electronics (PE & PEL) chapter, the Signal Processing Society (SPS) chapter, and Women in Engineering (WiE) affinity Group.*

Dr. Monowar Bhuyan, *Editor*

## A message to IEEE Sweden Section Members

Dear IEEE Sweden Member,

The first half of 2024 was a dynamic time for our Section, with the most remarkable event being the Annual General Meeting (AGM) held on March 20 in a hybrid format at LiU & Zoom. Newly elected officers for 2024 were installed, and a minor bylaw update was initiated. The event included a technical lecture by a new Fellow, Prof. Subhrakanti Dey, from Uppsala University. The Region 8 meeting took place in Vienna in March and was well-attended by the Section officers. The next R8 meeting is upcoming in October 2024 in France.

Overall, the Section is developing well, with many events organized by Chapters and student branches, as well as young professionals and women in engineering. The membership count is steadily growing. The Section received a full rebate including timely reporting bonus ensuring healthy economy. We also host several IEEE conferences, which are listed on the Section website. Initiatives to revive and install new Chapters are in progress.

Best wishes,

Prof. Andrei Gurtov, *Chair, IEEE Sweden Section*



## Senior Membership Campaign

This year, we are continuously running the senior membership campaign. If you believe you have fulfilled the requirements for senior membership and are looking for sponsorship, you can send your letter of interest and CV to IEEE Sweden Section. We will evaluate it and provide you with good references if approved. Basic requirements are that you shall practice in one of the fields of IEEE, have at least 10 years of professional experience, and have shown significant performance over a period of at least five of those years. More details can be found at [IEEE - Requirements for IEEE Senior Member Grade](#).

Dr. Ming Xiao, Membership Officer – IEEE Sweden Section  
mingx (at) kth.se

## Call for Life Membership Affinity Group

**IEEE Life Membership** is an official recognition of a strong and sustained commitment to IEEE. As there are currently near 140 life members in the IEEE Sweden Section, there is a high potential to start an IEEE Life Member Affinity Group under the Sweden Section. We welcome volunteers for this effort. Please make contact with the Section chair Prof. Andrei Gurtov, and the membership development officer Dr. Ming Xiao, if you are interested in this.

## Establishing new LMAGs



Potential to establish new LMAGs in 19 Sections of R8

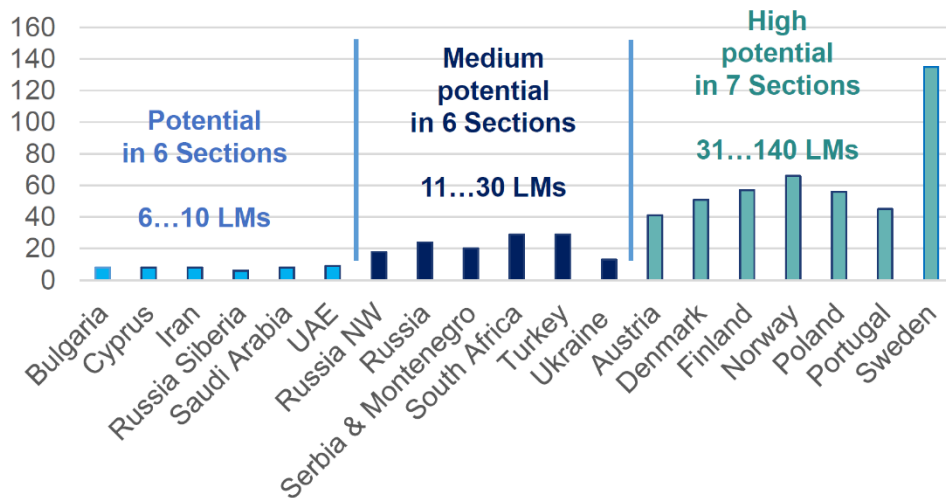


Fig. 1

## IEEE Power & Energy (PE) and Power Electronics (PEL) Sweden Chapter

This chapter had an annual meeting on February 21, 2024, at KTH - Royal Institute of Technology, Stockholm. Dr. Alireza Nami, Research Centre Manager, Hitachi Energy, gave an exciting keynote speech at that event. The title and abstract are listed below.



**Title: High Power Converters for the Energy Transition: A journey from Past to Present and Beyond**

**Abstract:** The energy transition to reduce CO<sub>2</sub> emissions is changing the power grids landscape. This requires transmission and distribution capacity enhancement, as well as controllability and power quality for increasing renewable production, often at remote locations. Likewise, CO<sub>2</sub> reduction drives an increase in electrification at the demand side, for example for the transportation and industrial infrastructure, which puts additional strains on the existing electrical systems. At Hitachi Energy Research we are investigating future power electronics solutions to enable a smarter, stronger, and greener power grids supporting the energy transition. Research and innovation will play a critical role in development and verification of new concepts in this area such as HVDC, MVDC, FACTS and other converter-based solutions.

Prof. Maryam Saeedifard, Georgia Institute of Technology, USA, gave an IEEE distinguished lecture on Tuesday, June 18, 2024, at KTH – Royal Institute of Technology, as well as via Zoom. The abstract and title of the lecture are given below.



**Title: Control and Protection of Multi-Terminal DC Grids**

**Abstract:** High Voltage DC (HVDC) transmission is a long-standing technology with many installations around the world. Over the past few years, significant breakthroughs in the voltage-sourced converter technology along with their attractive features have made the HVDC technology even more promising in providing enhanced reliability and functionality and reducing cost and power losses. Concomitantly, significant changes in generation, transmission, and loads such as (i) integration and tapping renewable energy generation in remote areas, (ii) need for relocation or bypassing older conventional and/or nuclear power plants, (iii) increasing transmission capacity, and (iv) urbanization and the need to feed the large cities have emerged. These new trends have called for Multi-Terminal DC (MTDC) systems, which when embedded inside the AC grid, can enhance stability, reliability, and efficiency of the present power grid. The strategic importance of MVDC and HVDC grids is evidenced by the number of worldwide projects currently in their advanced planning stage, e.g., European “Supergrids” and the Baltic Sea project along with several projects in the US and China. This presentation is focused on opportunities brought by the MTDC grids and addressing the technical challenges associated with their operation, control and protection in future power systems.

## IEEE Technical Seminar on “Energy Storage and Grid-Forming Control in Future Power Grids” by Dr. Ali Tayyebi and Dr. Shih-Feng Chou, Scientists at Hitachi Energy Research

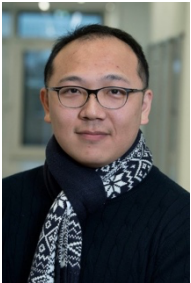
**Ali Tayyebi** is a Research Scientist in Hitachi Energy Research, Västerås, Sweden. His areas of interest are the power system dynamics, control, and stability, as well as the control of converter-based systems

such as FACTS and HVDC systems. On the other hand, **Shih-Feng Chou** is a Research Scientist and Research Project Lead at Hitachi Energy Research in Västerås, Sweden. His main responsibility is leading the technology development of energy storage system and its applications in modular multilevel converter based STATCOM. The title and abstract of the talks are given below.



**Title: On the role of energy storage and grid-forming control in the future HVDC systems**

*Abstract:* The so-called grid-forming (GFM) control of the converter-based generations is expected to address the stability, robustness, and operational challenges of the low-inertia power systems and is proven to be successful in various VSC-HVDC projects since 2010. Although, the definition of the GFM control widely varies across different applications, voltage levels, and generation technologies, recent efforts have been made to unify the definition. On the other hand, system operators and regulatory entities are collaborating to define new requirements for the transmission systems and renewable energy resource generations. As a result, the performance requirements for the futuristic converter-based systems, are broadly categorized under the GFM terminology. Blending the GFM control synthesis and HVDC transmission technology is perceived as a powerful two-fold solution for the stability issues and bulk power transmission requirement in the low-inertia power grids. In this viewpoint, the VSCs are expected to exhibit GFM behaviors in offshore wind farm, embedded, interconnector (between non-synchronous areas), and multi-terminal HVDC configurations. In this talk, we will explore the various aspects of GFM control for the HVDC systems, as well as the role of energy storage system in emerging power grids and its future scenarios.



**Title: Hybrid Energy Storage Enhanced STATCOMs**

*Abstract:* The energy-storage enhanced STATCOM (E-STATCOM) emerges as a promising solution for the grid balancing services, promoting massive adoption of renewable generation such as large-scale solar and wind power plants. The type of energy storage in E-STATCOM, e.g., supercapacitors or lithium-ion batteries, is highly dependent on the system application. Typically, the supercapacitor-based energy storage is suitable for fast and frequent services that require injection or absorption of high power, e.g., fast frequency response. Conversely, when massive quantities of energy are required over long periods of time (e.g., frequency containment reserve and frequency restoration reserve), the battery-based energy storage could be a superior choice. The increasing complexity of E-STATCOM operational requirements and design specifications introduces challenges when it comes to the system realization stage. A hybrid energy storage enhanced STATCOM that combines the advantages of both energy storage types can be a promising solution.

## IEEE Signal Processing Society (SPS) Sweden Chapter

IEEE Signal Processing Society (SPS) celebrated its 75th anniversary on Monday, January 17, 2024, at Stockholm with a discussion topic on “Speeding up distributed learning: towards low-complexity communication-efficient algorithms with super linear convergence” On June 10, 2024, Professor Subhrakanti Dey, Department of Electrical Engineering at Uppsala University, Sweden, gave a talk in the society.



**IEEE Sweden SPS Chapter Chair, attended the IEEE SPS Chapter Chair**

**meeting held at the 2024 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2024) in Seoul, Korea on 17th April 2024.**

**IEEE Sweden Signal Processing Society (SPS) Chapter, SPS Day 2024 Event, 10 Jun 2024, Time: 03:00 PM to 04:00 PM Seminar by Professor Subhrakanti Dey**

Topic on Speeding up distributed learning: “towards low-complexity communication-efficient algorithms with super linear convergence”



## IEEE Women in Engineering Affinity Group Sweden

This affinity group celebrated International Women Day on March 8, 2024, where Margaretha Eriksson gave a talk on Women and Leadership. She was the past director of IEEE Region 8.



**SWEDEN SECTION AFFINITY GROUP, WIE CELEBRATE 2024 IEEE WIE DAY With A talk on Engaging More Women in AI and 4IR Technologies on July 3 @ 12:00 - 13:00 Industry Speaker, Simil Susan of Afry**

Topic on “Unleashing the power of Words: A dive Into Large Language Models”



**CONGRATULATIONS to officer IEE WIE Affinity Group Sweden that accepted to participate in the 2024 the IEEE MGA Volunteer Leadership Training (VOLT) Program which starts on 09.17.2024.**

## **IEEE Student Branch – LiU, KTH, Chalmers, Sweden**

Among other events and activities, there was an IEEE Distinguished Lecture on May 17, 2024, at Linköping University by Torbjörn Andersson. The title and abstract of the talk are given below.



**Title: Ready To Join the Cybersecurity Industry? What You Need To Know**

**Abstract:** Interested in a cybersecurity career but not sure where to start? This talk is designed for you! Torbjörn Andersson will provide you with essential insights into the foundational skills, certifications, and internships that are crucial for your first steps toward a successful career in the cybersecurity field. Learn about the critical prerequisites and best practices that can kickstart your journey in the cybersecurity industry.

## **Upcoming Events:**

Sweden Section Affinity Group Women in Engineering and IEEE Signal Processing Society are collaborating on **ICACTCE**, November 29-30, 2024 – <https://icactce-conf.com>

## IEEE Worldwide

A snapshot of IEEE membership development since 2022 shows a substantial increase in IEEE membership yearly. These statistics include total memberships, higher grade memberships, and student memberships.

### Total memberships

There is a significant growth in overall memberships, which is visible from the below Figure 2.

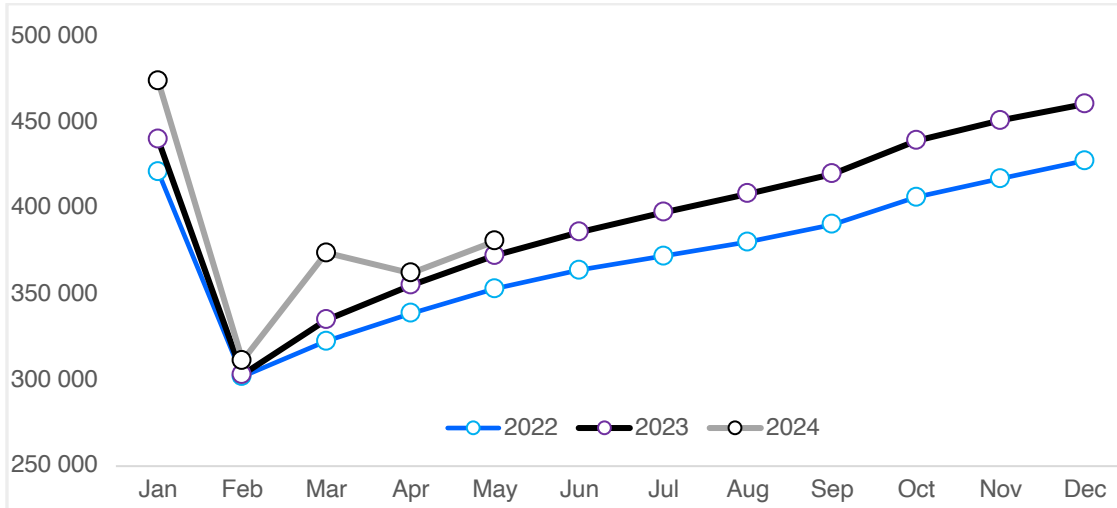


Fig. 2: IEEE overall membership growth

### Higher grade memberships

In parallel, quite a significant growth has been observed in their membership grades (See Figure 3).

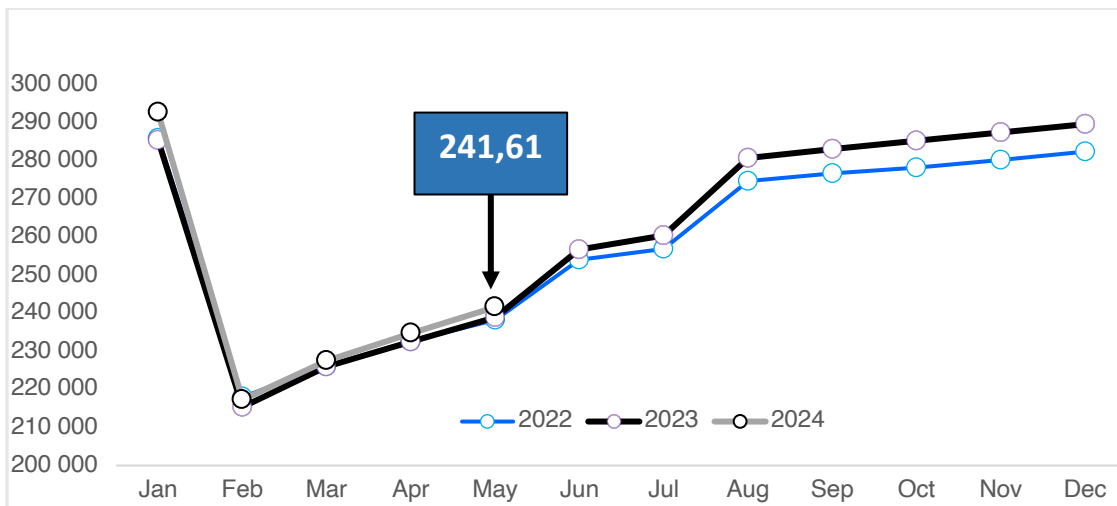


Fig. 3: Higher grades members

## IEEE Student Memberships

Here, overall, student memberships keep growing, as shown in Figure 4.

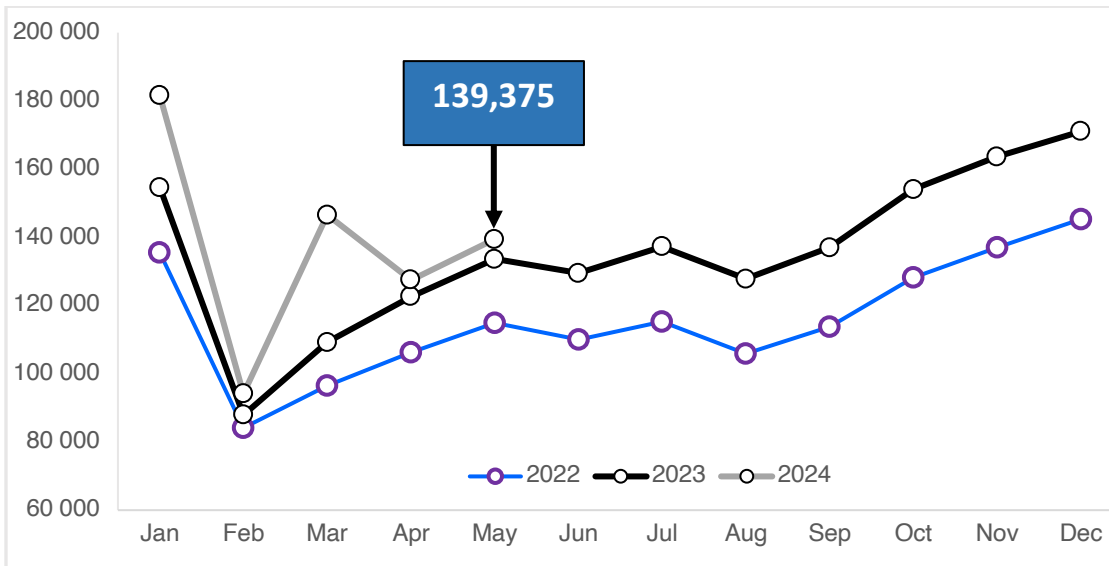


Fig. 4: Growth in student memberships

## Quick Facts About IEEE:

IEEE has:

- Over 460,000 members in more than 190 countries, with more than 66 percent from outside the United States
- More than 171,000 Student members
- 344 Sections in ten geographic Regions worldwide
- 2,709 Chapters that unite local members with similar technical interests
- 3,635 Student Branches at colleges and universities in over 100 countries
- 4,194 Student Branch Chapters of IEEE technical Societies
- 639 affinity groups; IEEE affinity groups are non-technical sub-units of one or more Sections or a Council. The affinity group parent entities are the IEEE-USA Consultants Network, Young Professionals (YP), Women in Engineering (WIE), and Life Members (LM)

IEEE:

- Has 39 technical Societies and eight Technical Councils representing a wide range of IEEE technical interests
- Has more than 6 million documents in the IEEE *Xplore*® Digital Library
- Has an active portfolio of 1,144 standards and more than 1,018 projects under development
- Publishes more than 200 transactions, journals, and magazines
- Sponsors more than 2,000 conferences and events in 190 countries while contributing over 4 million total conference papers to IEEE *Xplore* since 1936, with more than 200,000 new papers added annually



**Sites for Success:**

IEEEExplore: <http://ieeexplore.ieee.org>

IEEE ResumeLab [http://www.ieee.org/membership\\_services/membership/resumelab](http://www.ieee.org/membership_services/membership/resumelab)

IEEE Job Site <https://jobs.ieee.org>

IEEE Student scholarships, grants and fellowships:

<https://www.ieee.org/membership/students/scholarships-grants-and-fellowships.html>

IEEE Membership <https://www.ieee.org/membership/index.html>

IEEE Women in Engineering <https://www.facebook.com/ieeewomeninengineering>

IEEE University Partnership Program: <https://www.facebook.com/ieee.upp>

IEEE Member and Geographic Activities Operations Manual

<https://mga.ieee.org/board-committees/operations-manual>

IEEE Sweden Section Official Website: <https://r8.ieee.org/sweden/home/>

IEEE Sweden Section LinkedIn Group: <https://www.linkedin.com/groups/9188233/>