Members' Newsletter 2020- Q2

IEEE Sweden Section

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Editorial

The challenges created by coronavirus pandemic have been enormous. Nonetheless, IEEE Sweden section is determined to continue to make impact for the 2020 fiscal year. It is a trying time for the usual physical appearances in conferences and meetings, but created increase awareness of virtual meetings which we are determined to explore and utilize in full. I personally continue to see this challenge as a strong avenue of increasing our membership in all chapters. IEEE tools online are readily made available to us to remain efficient, creative, industrious and informed. The pandemic's unprecedented circumstances afforded many of us opportunities in eHealth. My recent published paper titled "COVID-19 Patient Health Prediction Using Boosted Random Forest Algorithm" is available online that supports IEEE stand point on Covid-19. We shall continue to deliver as entrusted the gains of membership to members of IEEE Sweden Section. The board remains grateful to committed members. We shall not relent in supporting and motivating you to reach the pinnacle of your set aside goals. This Newsletter is subject to nonstop improvements and aims at sharing information with IEEE members. Hence, we kindly ask for contributions, feedback and involvement from our readers. Please submit to the Newsletter Editor, Dr. Celestine Iwendi celestine.iwendi@ieee.org

A message from the Sweden Section Chair

Dear IEEE Member,

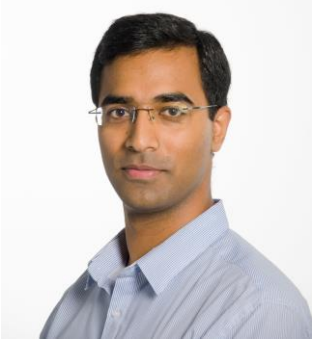
We are at the moment living in unprecedented times and while the COVID19 numbers around the globe aren't really looking good, we only hope that the situation improves soon, and we are back to normalcy. Meanwhile, I truly hope that you and your loved ones are safe and sound.

Activities around the section have mainly been driven by the chapters and affinity groups with a good number of events conducted online. At the same time, there have been some deviations to planned events and conferences such as the ISCMI20; that was to be held in Stockholm later this year- has been converted into a full-fledged virtual conference on the same dates. (http://iscmi.us/)

The IEEE R8 SYP, the much-anticipated event of the year, to be held in Gothenburg has also been cancelled and the team is looking at options for running it virtually while still aiming to host in Sweden in the coming years.

As engineers, scientists, inventors, solutionists, we are being challenged by the ever-growing needs of technology that enables us to connect and deliver in the current situation. It's very important that we continue to evolve and support the world around.

With summer almost nearing the end, I look forward to an exciting and safer autumn. I wish you a safe and pleasant summer.



Samarth Deo
Chair IEEE Sweden Section

R8SYP Congress Gothenburg update in light of COVID-19 situation

Dear Region 8 section chairs,

In continuation from the previous letter; in the wake of recent escalations of COVID-19 and the developments over the last few months and with striving to ensure the safety, certainty and reliability to our dear volunteers, **we had made the sad decision of not holding the Region 8 Student and Young Professionals Congress 2020 in the envisioned form of in-person meeting during August 5th to 9th, 2020.**

Initially, we have tied the decision together with IEEE Section Congress (August 21st - 23rd) and the 115th IEEE Region 8 Meeting (August 19th - 20th), and currently Quebec, Canada has called for cancellation of all large events until August 31st, 2020 while Ontario (including Ottawa) has issued an equivalent call until June 30th, 2020. The decisions have already influenced large IEEE events such as the "2020 PES General Meeting" (scheduled for August 2nd – 6th, 2020 in Quebec, Canada), which is now set to be held in virtual form. Similar restrictions apply in some countries of Europe, e.g. Germany restricts large gatherings until August 31st, 2020, while the heaviest concerns are regarding Schengen visa issuing, which is now estimated possibly for September but only with provided proof of testing (published here). In addition, IEEE has issued a travel reimbursement ban that has not yet been lifted at this point.
Currently, Sweden is restricting events larger than 50 people with imposed travel ban, and the Swedish Ministry of External Affairs answered to the hosting team with a statement that nothing can be estimated before the travel ban is lifted. Although we expect that by August the situation will pass in Europe, China and part of Middle East, and the trends for the rest of the world are with 2 - 4 weeks delay in comparison to Europe.
All of the above is a brief sum up of our continuous monitoring from the perspective of five different committees (SYP 2020 hosts, R8SAC, R8WiE, R8CCT and R8YP – incorporating over dedicated 40 volunteers) and bi-weekly meetings holding since February 2020.

This recommendation is weighted heavily and carefully, always having in mind the health of all the people involved in the event, and especially our region's students and young professionals coming from all our sections while embracing diversity and the desire to be part of the technology frontier that will always bring us together.

In this light, we have adopted a new action plan of proceeding further on with congress organization while maintaining a close communication with you on relevant updates:

- The SYP organizing team and Region 8 are now dedicated on finding the next best alternative solution
- The teams have already gathered many perspectives on what is best for our students, young professionals, sections and Region 8
- We continue to closely monitor the situation every day in all corners of our Region
- We will maintain these regular monthly letters on the summary status of the organization
- We expect that by the next letter, we will have the mutually established strategy on how to proceed.

Thank again you for your support to your students and young professionals, and for being a role-model in these challenging times.

We wish you good luck and safety during May, and hope you may return soon from your home offices while retaining a dear part of it in your working environment!

Kind regards on behalf of our teams and committees,

Gerard Duff, IEEE Region 8 Student and Young Professionals Congress Gothenburg Chair
Samarth Deo, IEEE Sweden Section Chair

IEEE's response to COVID19

IEEE has made the following resources available to help in the fight against COVID-19:

- Datasets related to COVID-19 freely available on IEEE DataPort - https://ieee-dataport.org/

- About 500 articles in Xplore related to COVID-19 are being offered to the worldwide scientific community for free - https://spectrum.ieee.org/the-institute/ieee-news/covid19-related-research-and-technologies-free-to-access-in-ieee-xplore

- EMBS is fast tracking review and publication of COVID-19 related research, data and analysis and then making it available open access.

- EA is running a series of webinars to help educators and parents learn about and use IEEE educational resources.

- Spectrum is sharing forward trustworthy information via its COVID-19 News & Resource page: https://spectrum.ieee.org/the-institute/ieee-covid19-resources?_ga=2.226163610.1671898850.1585514281-179515004.1525031329

Chapters Summary Activities

The Young Professionals (YPS)

With the postponement of the Region 8 Students and Young Professionals Congress, the Sweden chapter organised an online event on "COVID19: Surveillance is Not The Cure, Big Tech Not Our Salvation" The speaker was Anouk Ruhaak – who has a background in computer science from a recent piece she wrote for WIRED magazine in the U.S.: Data Brokers Are Cruising for a Bruising. Anouk is a London-based Mozilla Fellow researching privacy, data stewardship, and AI. Anouk is eager to deliver an IEEE "Connecting Leaders" talk about the ways powerful tech platforms are collecting health data during the pandemic. Anouk recently wrote an open letter to the UK's NHS on this topic, which has garnered attention from The New Statesman and The Register. The talk took place on June 23rd, 2020.

Her talk covered:

– Outsourcing of key digital services to big tech and the data sharing arrangements that come with it (and how that's been ramped up since Covid-19).

– What privacy concerns we should be wary of

– What different data governance models we may want to consider to keep our data safe and under democratic control (specifically data trusts). The talk was about 40 minutes long, with 20-30 minutes allotted for questions afterwards.

Membership statistics in Sweden for Year 2020

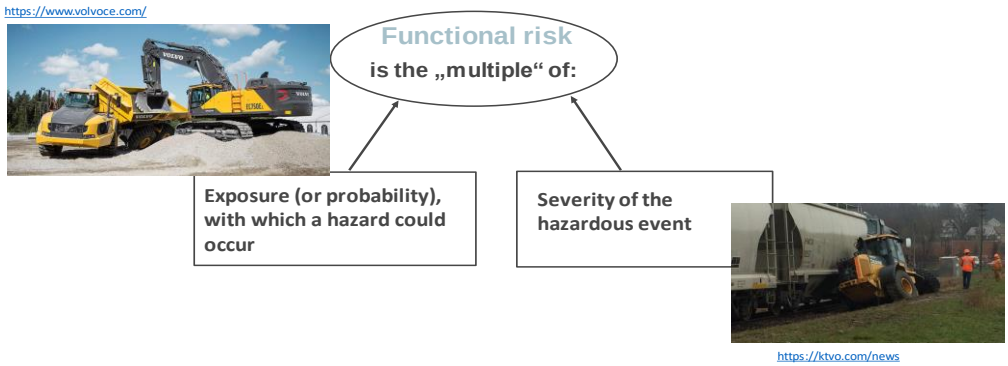
We have about 1800 active members in Sweden in mid-June, which is a quite good number in this period when we see membership number drops globally during the pandemic of COVID-19. Among these, we have 53 IEEE Fellows (including 18 Life Fellows), 374 Senior Members (including 43 Life Seniors), and about 900 professional Members (including 54 Life Members). We encourage more people to join the IEEE community and we are organizing more online activities (such as the Industry workshop) during this pandemic time.

Action for Industry 2020

Action for Industry is part of IEEE initiative to bring IEEE closer to the engineers. In Sweden, Action for Industry is driven by Prof. Dr. Viacheslav Izosimov, who spent some time in academia obtaining a PhD and a Docent degree but now fully dedicated himself to industry, shifting focus from research paper deadlines to the product releases. According to Viacheslav, Swedish industry initially surprised by covid-19 is getting back on track with many companies using this time for opportunity growth and talent acquisition. If some take more careful approach permitting short term leaves of the employees, others utilize capacity of available online infrastructures, distributing and streamlining development both locally in Sweden and globally, aggressively hunting for new colleagues and heavily investing into development of prospective products and services. If previously physical location was critical, this day it is no longer an issue to have an engineer from the Northern Sweden working full-time in Skane from the home office. Surprisingly even production gets boosted, opening up for summer internships and entry level employment opportunities. Same goes even for the events. Costly and time-consuming travelling is not anymore a requirement to attend an event or a conference. It is possible to be part of several online conferences at the same day, not being constraint by travelling. The work day becomes fragmented, opening up for more time with family and utilizing time previously not possible to be utilized, when everyday travelling to office is not needed. Meeting colleagues from China early morning and having a conference with US close to the midnight is a reality, permitting truly global work day schedule.

IEEE Action for Industry is also utilizing this opportunity to bring online events to engineers. An example of online event hosted by the Action is a recent Webinar on Functional Safety given by Viacheslav. The event was attended by more than 100 participants from both industry and academia. Microsoft Teams tool was used to host the event. The event was organized in collaboration with Semcon. After short intro of IEEE and few words about Semcon, Viacheslav shared how functional safety can make a difference between a termination of the project and a success of the product in the international market, the benefits, techniques to use, and some of the problems to be aware of. Multiple questions were brought to the table such as: How do we set functional safety processes? Who should be part of the team? What is the right approach from engineering point of view? How can we work together with functional safety in distributed environments? Any relationship to cyber-security? Why would we want to do this in early project phases e.g. already in RFQ or even RFI? Is it a necessity? And many others.

Despite the impact of covid19, the future of Swedish industry looks promising. Swedish industry takes the lead of the digital transformation of the work space and the way we do business. 2020 will become a year where a new era of digital online revolution started and all our previous “manual” habits and routines would change at once.



Alexanderson Day

The last Sunday of June or the 1st Sunday of July every year is called Alexanderson Day in Grimeton Radio Station [1]. On this day, the Grimeton Radio Station located in Varberg, province of Halland in Sweden, sends a Morse code signal (for SAQ) using their 17.2 kHz, 200 kW Alexanderson transmitter with 1.9 km antenna and the code is received across the Europe. This day is named after Ernst F. W. Alexanderson (1878 - 1975), Swedish engineer and inventor and the president of IRE (former IEEE) during 1921 [2]. He was born in 1878 in Uppsala and after earning a degree in electrical engineering at KTH, Stockholm in 1900 he moved to Germany for higher education. It was there when he learned about Charles Proteus Steinmetz and his inventions [3]. Thereafter he migrated to USA and joined General Electric (GE) in 1902. In pre-vacuum tube era, the way of generating a radio signal was an electric spark which suffered from damping and low range. Instead, he devised a method based on working principle of an AC generator. Also known as “alternator” (Figure 1a), it was meant to generate AC sinusoidal waveforms to carry Morse signals. The alternator is composed of a rotor on which many magnetic poles were installed as well as a stator which accommodates a set of parallel coils. High rotational speed (using a motor with ≈ 2000 rpm) and large number of magnetic poles (e.g. 500) leads to generation of AC waveform in the kHz range within the coils [4-6].

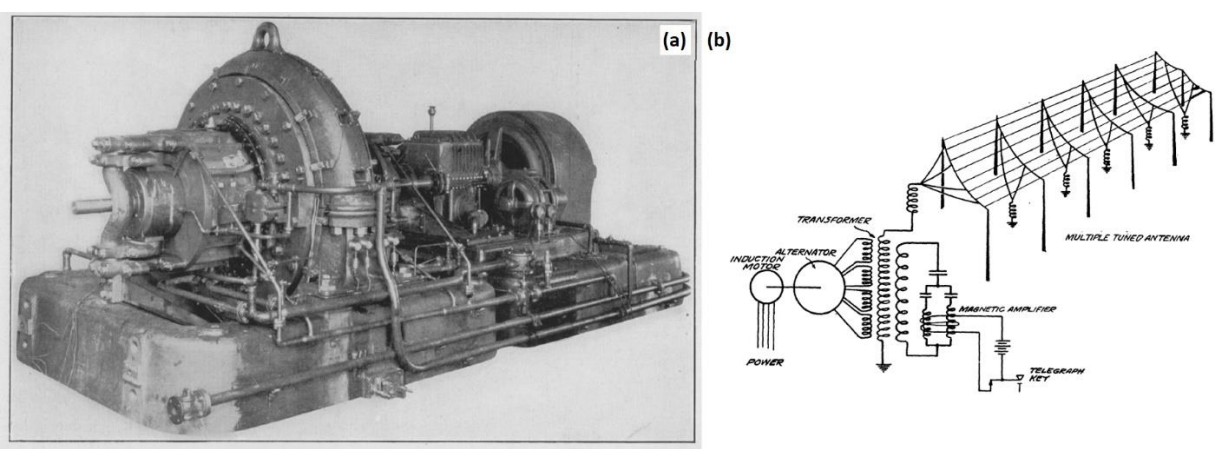


Figure 1. (a) A 200 kW Alexanderson alternator used by US Navy. (b) A simplified diagram of the Grimeton Radio station. Morse codes are amplified using a magnetic amplifier invented by Alexanderson (see reference [5]) and modulate the carrier frequency. The 1.9 km antenna is made of 8 long wires sitting on 6 masts and a few on-the-ground tunings inductors. Figures adapted from reference [4] with IEEE permission.

The AC signal in each coil is then coupled to an inductively tuned antenna which is a series of long wires installed on a few tall masts (Figure 1b). The Morse codes are coupled by another transformer to the antenna. The code modulates the waveform by making it on-resonance and off-resonance (very low amplitude as a result) for line and

dots, respectively. This frequency range (17.2 kHz) which is called very low frequency (VLF) is reflected and guided by ionosphere of the earth, making it feasible to send telegram signals across the Atlantic Ocean. During 1918 a network of these transmitters was connecting Poland to Hawaii [7]. Alexanderson explained his ideas in the Proceedings of the IRE (former Proceedings of the IEEE) [4,5].

His inventions sparked a new era of pre-vacuum tube radio communication across America. The Canadian pioneer of radio engineering, Reginald A. Fessenden, used one of Alexanderson's alternators to demonstrate the transmission of sound and music from his station in Banton Rock, Massachusetts in 1906 [2]. After the First World War, Alexanderson joined the radio corporation of America (RCA) as a chief engineer, he was awarded the IRE Medal of Honor in 1919 and then he became the president of IRE in 1921. Until his retirement in 1948 he actively invented many systems e.g. mechanical-scan TV, aircraft altimeter [8] and contributed to Radar efforts during WWII. He had more than 340 US patents.

In 1921 the Swedish government felt the urge of installing an independent radio station for telegram communication over Atlantic Ocean in order to avoid isolation from the rest of the world should neighboring countries go into another war. The shores of south western Sweden in Varberg was chosen to install 6 masts of 127m height to hold an antenna of 1.9 km length. The 17.2 kHz frequency was chosen to match with the reception frequency of the receiver of the same type located at Long Island, New York. The first telegram message was SAQ sent to Long Island station. The station was opened by King Gustav V of Sweden by sending a telegram to American president Calvin Coolidge in 1924 [7]. Grimeton station was chosen as a World Heritage site by UNESCO in 2004 [7]. Sadly, due to outbreak of COVID-19 epidemy, the Alexanderson day ceremony of this year was cancelled. However, the Grimeton station [1] as well as the Alexander association webpage [9] offer more information and update on events and services they provide during summer. Surely watching the still operating gigantic Alexanderson alternator is a source of inspiration for us and appreciation of what previous generations of electrical engineers did until we get to this point in wireless communication technology.

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[3] J. E. Brittain, "Electrical Engineering Hall of Fame: Ernst F. W. Alexanderson," in *Proceedings of the IEEE*, vol. 92, no. 7, pp. 1216-1219, July 2004.
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[9] Webpage of Alexander Association: https://alexander.n.se/?lang=en

Sites For Success

IEEEXplore: http://ieeexplore.ieee.org
IEEE 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
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IEEE Women in Engineering
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https://www.facebook.com/ieee.upp
IEEE Member and Geographic Activities Operations Manual
https://mga.ieee.org/board-committees/operations-manual