

IEEE New Zealand Central Section Report

February 2022

PART A - SECTION SUMMARY

A.1 Executive Summary

- **Section Executive Committee Member List**

○ Chair:	Yi Mei
○ Vice Chair:	Chanjief Chandrakumar
○ Immediate Past Chair:	Murray Milner
○ Secretary:	Murray Milner
○ Treasurer:	Donald Bailey
○ Membership Development:	Qi Chen
○ Webmaster:	Richard Harris
○ (Joint) Education Coordinator:	Nurul Sarkar
○ Professional Coordinator:	Fangfang Zhang
○ Industry Coordinator:	Sridhar Pulikanti
○ Young Professionals:	Hoai Bach Nguyen
○ Women in Engineering:	Kanwal Zaidi, Bing Xue
○ Life Member Coordinator:	Murray Milner
○ Victoria Student Branch Chair:	Fangfang Zhang
○ Massey Student Branch Chair:	Yuan Chang
○ Student Counsellor:	Mengjie Zhang, Donald Bailey
○ Central CI Chapter Chair:	Mengjie Zhang
○ NZ Joint SP/IT Chapter Chair:	Yusuke Hioka
○ NZ Communications Chapter Chair:	Nurul Sarkar
○ NZ I&M Chapter Chair:	Akbar Ghobakhlou
○ Central Power and Energy Chapter Chair:	Ramesh Rayudu
○ Xiang Gui	
○ Gourab Sen Gupta	
○ Andrew Lensen	
○ Fanglue Zhang	
○ Alex Doronin	

- **Section Highlights**

- Despite the continuous challenges caused by COVID-19, the New Zealand Central Section still has had another successful year in 2021. Although many events had to cancel or postpone, we still managed to hold many events (in-person or virtual) for members across many areas of interest. Many of these events involved Distinguished Lecturers from around the world. It is these activities which members find most interesting and enable us all to keep at the forefront of research within our fields of interest.
- Our Section has retained very good membership status and received an IEEE R10 Best Membership Retention Small Section Award 2021.
- In 2021 we again successfully held our two most prestigious events, being the Postgraduate Symposium and the Combined Institutions Breakfast. The first of these events is primarily focused on our student members, while the latter is focused on our industry collaboration. These events were again well received by members. More details on these events are provided below.
- We have successfully appointed several new positions, including the Education Coordinator (jointly with all NZ Sections), Professional Coordinator, History Coordinator, and Life Member Coordinator. We have also successfully appointed succession for several important positions, including the Webmasters, Industry Coordinator and Chairs of the two student branches. This ensures the ongoing functionalities of the Section.
- Our Joint Education Coordinator, Nurul Sarkar, has been selected as the IEEE STEM Ambassador 2021 (nominated and supported by the Chair Yi Mei).

- **Major Events (International, National)**

- 28 October 2021: The Section organised the Joint Institutions Breakfast event, together with ENZ and IET. This in-person event was held at Wellesley Boutique Hotel with 32 people in attendance from IEEE, ENZ, IET and outside. We invited John Clarke, a General Manager in Transpower, New Zealand, to give a presentation on “Sustainable Energy Future Enabling electrification of the NZ economy supported by renewable generation”. The presentation went very well. John introduced a range of significant projects for decarbonization that Transpower is working on towards zero emission and their challenges. This was followed by a Q&A session, when John answered the questions from the audience and the audience voted for the top three most important directions towards zero emission from the 10 options John provided. There was a very high engagement throughout the event. This is an excellent event for sharing between institutions and for engagement with industry.
- 19 November 2021: The Section Communications Chapter organised an IEEE New Zealand Wireless Workshop in Victoria University of Wellington. The IEEE New Zealand Wireless Workshop is a premier annual event that brings together industry professionals, research institutes, academics, start-ups, postgraduate students, and policymakers for one day to discuss technologies and issues of interest to the wireless community in New Zealand. The day consists of a series of presentations from participants with opportunities for informal discussions and networking.
- 19 November 2021: The Section CIS Chapter organised an Innovative NZ Data Science Workshop, which is the first workshop on the eight Data Science programmes funded by the Ministry of Business, Innovation & Employment’s (MBIE) Strategic Science Investment Fund and Catalyst fund. A large number of Chapter members jointly received a \$13 million NZD grant to lead a large such program, focusing on fundamental research in data science, AI and machine learning and applications to aquaculture. The key technology themes include modelling/symbolic regression/feature engineering, computer vision and image analysis, transfer learning, multi-objective decision making, and explainable AI and visualisation. The workshop provided the opportunity to hear from programme leaders and key members on the data science programmes funded by MBIE. These programmes enable an active partnership between government and research organisations to deliver government science priorities. Workshop attendees included those from Te Herenga Waka—Victoria University of Wellington, MBIE, The University of Auckland, University of Waikato, Māori Television, Massey University, Landcare Research, Cawthron Institute, University of Otago, Plant and Food Research, Auckland University of Technology, University of Canterbury, Scion, Beca, MetService, Dragonfly Data Science, MetOcean Solutions. Eight programme leaders presented in the morning session to discuss their major progress, key members, achievements, and challenges, followed by a question and answering session. The first topic for discussion was about the experience and challenges in recruiting postdoctoral and postgraduate students, and researcher skill development. Mātauranga was a key topic at the workshop, including how to work toward a better understanding of mātauranga Māori principles in the science system, build long term relationships and goals, and provide all researchers with training. Other topics included discussion of opportunities for cooperating and collaborating with different partners, an update from Catherine Hunter on the mid-term review of the Strategic Science Investment Fund programmes, and a discussion led by the University of Waikato’s Professor Albert Bifet on the White Paper ‘Aotearoa New Zealand Artificial Intelligence – A Strategic Approach’.
- 26 November 2021: The IEEE Postgraduate Symposium was held at Victoria University of Wellington in Kelburn, Wellington. This event involved presentations from 30 PhD students from Victoria University of Wellington and Massey University (Palmerston North) to present their research work. In addition, there were approximately 40 fellow students who enjoyed the presentations. The three best presentations were recognised and awarded with prizes.

- **Major Chapter Activities**

- IEEE NZ Central Computational Intelligence Society Chapter
 - 15 January 2021: The Chapter Chair Prof Mengjie Zhang gave a seminar on “How to write a paper for experimental research”. A discussion was made during the presentation and at the end.
 - 12 February 2021: The Chapter invited Kevin Shedlock from Victoria University of Wellington to give a seminar on “Te Ruapekapeka Pa: A kaupapa māori case study

- research during the construction of the IT artefact”. This is to enhance the knowledge of NZ researchers for the Māori research, which is very important for NZ.
- 26 February 2021: The Chapter invited Dr. Baligh Al-Helali to give a presentation on “Discussions on Hybrid Algorithms in Evolutionary Computation”. A discussion was made during the presentation and at the end.
 - 26 March 2021: The Chapter invited Dr. Andrew Lensen to give a presentation on “Mining Feature Relationships in Data”. A discussion was made during the presentation and at the end.
 - 28 May 2021: The Chapter organised a DSAI/ECRG Pipitea Marae Visit. We were hosted by the Ngāti Pōneke Young Māori Club who are the long-time residents and the backbone of Pipitea Marae. This visit is an important and first step for our rūpū to learn about the Māori culture and DSAI related topics such as Māori data sovereignty, ownership, and management. Our Chapter/DSAI/ECRG rūpū has over 50 researchers in Data Science, Artificial Intelligence and Evolutionary Computation, and received over \$30 million of research grants including the MBIE SSIF Fund on Data Science for Aquaculture. Learning about Māori culture and building capability in Māori researchers is an important aspect of our research programme. We have been collaborating with multiple iwi groups across the country and establishing a series of internships and scholarships to support Māori students to learn and carry out research in artificial intelligence, computer science, data science and statistics at VUW. As a rūpū we look forward to more events like this visit to connect with tangata whenua.
 - 26 June 2021: The Chapter Chair Prof Mengjie Zhang gave a seminar on “Genetic Programming for Multi-class Classification”. Around 40 people attended, and very good discussions have been made after the talk.
 - 2 July 2021: The Chapter Chair Prof Mengjie Zhang gave a seminar on “Gradient Descent Research in Genetic Programming”. Around 40 people attended, and very good discussions have been made after the talk.
 - 9 July 2021: The Chapter organised to watch a keynote speech “When Everything Else Fails, Try Co-evolution”, Professor Xin Yao's keynote speech at IEEE CEC 2021. Due to the time difference, many CIS members and students in our Chapter could not attend the live talk. Co-evolution is a hot topic and a number of members in the Chapter have been using it. So our Chapter watched the video of this keynote speech and hosted a big discussion at the end.
 - 16 July 2021: The Chapter organised to watch a keynote speech “AI-based business applications and the EC research”, Professor Zbigniew Michalewicz's keynote speech at IEEE CEC 2021. Due to the time difference, many CIS members and students in our Chapter could not attend the live talk. Co-evolution is a hot topic and a number of members in the Chapter have been using it. So our Chapter watched the video of this keynote speech and hosted a big discussion at the end.
 - 23 July 2021: The Chapter organised to watch a keynote speech “Lessons Learned after 25 Years Designing Multi-Objective Evolutionary”, Professor Carlos Coello Coello's keynote speech at IEEE CEC 2021. Due to the time difference, many CIS members and students in our Chapter could not attend the live talk. Co-evolution is a hot topic and a number of members in the Chapter have been using it. So our Chapter watched the video of this keynote speech and hosted a big discussion at the end.
 - 27 Aug 2021: The Chapter Chair Prof Mengjie Zhang gave a seminar on “Genetic Programming with Building Block Analysis, Brood Recombination and Surrogate”. A discussion on the similarities and differences between different concepts was made at the seminar, and a suggestion was that we/researchers should be more accurately recognise and properly cite the literature.
 - 10 September 2021: The Chapter invited Dr. Cuie Yang to give a presentation on “Transfer learning and domain adaptation”. This technical talk presents a co-training framework for Heterogeneous Heuristic Domain Adaptation. It aims at addressing unsupervised domain adaptation where a labeled source domain and an unlabeled target domain are given. Recent advanced domain adaptation methods attempt to remove domain-specific properties by separating domain-specific information from domaininvariant representations, which tends to be suboptimal. It allows network structures to be different between domains to avoid the underfit and overfit of the

heuristic network. The talk also discuss how EC techniques can be used in this framework.

- 1 and 22 October 2021: The Chapter invited Kevin Shedlock to give presentations on “Data sovereignty with Maori and AI (Part 1 and 2)”. This technical talk is important part of the research in NZ and research grant applications. All academic staff members and research students are firstly encouraged then required to get to know the government and university policies on Maori Data Sovereignty and the Treaty of Whantangi. In particular, AI and EC techniques have close relationship with Maori Data and Maori community. The Chapter scheduled two sessions to learn and discuss how to treat, understand, use Maori data with our AI and EC techniques, and how to establish relationship with Maori people, and the potential aspects that our AI/EC researchers should be noted.
 - 8 October 2021: The Chapter invited the Director of the Computational Media Innovation Centre (CMIC) Taehyun Rhee to present the key research areas and directions that CMIC people have been doing and are closely related to the AI and EC research people in our Chapter. The talk gives three major areas: deep learning and CNNs, image and vision computing, and animation and VR/AR. The people in both side attended the seminar talk via Zoom due to COVID-19. This is a long session and a lot of discussions were made.
 - 19 November 2021: The Chapter organised an Innovative NZ Data Science Workshop, which is the first workshop on the eight Data Science programmes funded by the Ministry of Business, Innovation & Employment’s (MBIE) Strategic Science Investment Fund and Catalyst fund. A large number of Chapter members jointly received a \$13 million NZD grant to lead a large such program, focusing on fundamental research in data science, AI and machine learning and applications to aquaculture. The key technology themes include modelling/symbolic regression/feature engineering, computer vision and image analysis, transfer learning, multi-objective decision making, and explainable AI and visualisation. The workshop provided the opportunity to hear from programme leaders and key members on the data science programmes funded by MBIE. These programmes enable an active partnership between government and research organisations to deliver government science priorities. Workshop attendees included those from Te Herenga Waka—Victoria University of Wellington, MBIE, The University of Auckland, University of Waikato, Māori Television, Massey University, Landcare Research, Cawthron Institute, University of Otago, Plant and Food Research, Auckland University of Technology, University of Canterbury, Scion, Beca, MetService, Dragonfly Data Science, MetOcean Solutions. Eight programme leaders presented in the morning session to discuss their major progress, key members, achievements, and challenges, followed by a question and answering session. The first topic for discussion was about the experience and challenges in recruiting postdoctoral and postgraduate students, and researcher skill development. Mātauranga was a key topic at the workshop, including how to work toward a better understanding of mātauranga Māori principles in the science system, build long term relationships and goals, and provide all researchers with training. Other topics included discussion of opportunities for cooperating and collaborating with different partners, an update from Catherine Hunter on the mid-term review of the Strategic Science Investment Fund programmes, and a discussion led by the University of Waikato’s Professor Albert Bifet on the White Paper ‘Aotearoa New Zealand Artificial Intelligence – A Strategic Approach’.
 - 3 December 2021: The Chapter organised a forum with a big discussion on a number of key spaces: search space, solution space, feature space, data space, task space, label space, etc. These share similarities, but are also different. Some of them are easily confused. The discussions further clarified a number of important concepts in our AI research, particularly evolutionary computation and neural networks.
- IEEE Joint NZ Communications Society Chapter
 - With the nomination and support from the Section, the Chair of the Joint Chapter, Nurul Sarkar, has been selected as an IEEE STEM Ambassador (2021-2022), in recognition for his outstanding contributions to pre-university STEM education and community development in New Zealand.

- 20 February 2021: The Chapter organised an IEEE-IQRA Community Workshop. This is a follow up IEEE-IQRA community workshop from the last three successful ones. This workshop aims to provide an overview of “Emerging Technologies for Humanities” to enhance students’ learning and comprehension.
 - 27 March 2021: R10 Educational Activity Workshop: I have attended the orientation workshop of “Educational activity chairs of Region 10” held on Saturday 27 March from 3 to 5 pm (NZ time). This virtual workshop was well-organized, and I have attended for the whole duration (two hours). About 18 participants from Asia/Pacific region attended the event. Prof Deepak Mathur (R10 Director) gave an opening speech highlighting the success of educational activities (EA) in recent years. Some new projects along with the application procedure and portal submission have been discussed. IEEE EA for Pre-University and University students were highlighted. I think we need to integrate/coordinate all the EA that we do throughout the year for reporting purposes. A good coordination among the various groups within NZC Section, including student branches, WIE, and Chapter Chairs is required for our success. Second, our EA will need to be shared/published through various social media (e.g., Facebook, Twitter, LinkedIn, YouTube, etc.) so that people across the globe will be aware of our good work that we are doing in NZ.
 - 12 May 2021: The Chapter organised a talk on “Mobility & Cyber Physical Intelligence” by Prof Adnan Al-Anbuky from AUT.
 - 29 May 2021: 2021 ComSoc VDL Series: We have had an excellent VDL lecture by Prof Misra today (4 pm NZ time). The talk went very well. We started at 3.45pm and finished at around 5.15pm. We really enjoyed the lecture and learned more about UAV Networks, Architectures/topologies, applications, design issues and challenges. A short prototype video associated with his work at SWAN Lab (IIT Kharagpur India) was presented. We thank Prof Sudip Mishra for his valuable time especially weekend to give a talk. Thanks go to participants for their support and to make the event a grand success. We also thank IEEE ComSoc for their approval, financial and logistic support. Despite of the busy time of the year, about 23 participants attended the event. We had Q/A after the lecture. We received positive feedback from the audience indicating that the VDL event was successful.
 - 17 June 2021: 2021 ComSoc VDL Series: Prof Biplab Sikdar gave an excellent virtual distinguished lecture (VDL) “Cyber Security and Privacy for Smart Cities” on Thursday 17 June 2021. The talk went very well. We started at 3.45pm and finished at around 5.30 pm. We really enjoyed the lecture and learned more about Security and Privacy issues in the design and implementation of Smart Cities. We thank Prof Sikdar for his time to prepare this talk. Thanks go to participants for their support and to make the event a grand success. We also thank IEEE ComSoc for financial, and logistic support. Despite of the busy time of the year, about 96 participants attended the event. We had Q/A after the lecture. We received positive feedback from the audience indicating that the VDL event was successful.
 - 8 July 2021: ComSoc VDL Series: Associate Professor Kaibin Huang (The University of Hong Kong) gave a fantastic talk “6G Intelligent Edge — The Fusion of Communication and Computing” on Thursday 8 July 2021. We had a bit of discussion before the actual talk started at 4 pm. People have enjoyed tutorial-style lectures and learned more about 6G Intelligent edge learning and computing, resource management, and practical applications of edge computing. We thank Prof Huang for his time to deliver this talk. Thanks go to participants for their support and to make the event a grand success. We also thank IEEE ComSoc for financial, and logistic support. Despite the busy time of the year, about 30 people attended the lecture. We had Q/A after the lecture. We received positive feedback from the audience indicating that VDL was successful.
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- IEEE Joint NZ Instrument and Measurement Society Chapter

- 30 March 2021: The Chapter organised a seminar at ABI by Ben O'Brien, titled "From artificial muscles to motion capture gloves".
 - 10 December 2021: The Chapter organised a Keynote talk on "Optical and Image Processing Applications in Bioengineering" by Andrew Taberner and Poul Nielsen, co-sponsored by the IVCNZ conference.
- **Major Student and Affinity Group Activities**
 - 13 May 2021: Organisation of a hybrid YP seminar event on "Success After Graduation". Details below in the YP Affinity Group Activities.
 - 14 September 2021: Organisation of the Joint virtual networking activities together with the Australia New South Wales WIE Group.
 - 27 September 2021: Organisation of the Joint WIE virtual networking and Webinar event on "Stress Management and Mental Wellness", together with Australia New South Wales Section WIE Group.
 - 25 October 2021: Co-organise the Joint WIE Tech Talk Series – IMS Insights into Intelligent System Deployment, together with Australia New South Wales Section WIE Group.
 - 26 November 2021: The IEEE Postgraduate Symposium was held at Victoria University of Wellington in Kelburn, Wellington. This event involved presentations from 30 PhD students from Victoria University of Wellington and Massey University (Palmerston North) to present their research work. In addition, there were approximately 40 fellow students who enjoyed the presentations. The three best presentations were recognised and awarded with prizes.
 - 29 November 2021: Co-organise the virtual event "navigating competitive grant application processes" together with Australia New South Wales Section WIE Group and YP Group.
- **Awards**
 - The Section Received an IEEE R10 Best Membership Retention Small Section Award 2021.
 - Our CIS Chapter received \$1000USD from IEEE Computational Intelligence Society in 2021 as a reward to the activities held in 2020.

A.2 Financial Report

- Summary (balances as of 31 December 2021)

Local account		NZ\$ 15,910.38
NextGen banking		US\$ 8,754.03
- Income and expenditure are summarized for 2021 as follows:

Income (NextGen)		
Section Rebate		US\$ 3,860.10
Incentives		US\$ 2,500.00
WIE Support		US\$ 77.00
Interest		US\$ 11.82
Net Income (NextGen)		US\$ 6,448.92
Income (Local account)		
CI Chapter awards		NZ\$ 1,419.80
Interest		NZ\$ 5.35
Total income		NZ\$ 1,425.15
Expenditure (Local account)		
Meetings		NZ\$ 3,362.83
Student activities		NZ\$ 1,522.57
Grants		NZ\$ 590.64
Bank fees		NZ\$ 0.76
Other reimbursements		NZ\$ 263.65
Total expenditure		NZ\$ 5,740.45
Net expenditure (local account)		NZ\$ 4,315.30
Converted to US\$:		US\$ 2,946.89

PART B - ORGANIZATIONAL ACTIVITIES

B.1 Membership Development Activities

- Total number of active members in the past 3 years.
 - 2019: 264
 - 2020: 266
 - 2021: 271
- Summary and evidence of work done to improve the value of membership, which leads to retention and growth of members.
 - Each year letters are sent to members within the Section coverage area who are late to pay their fees for the new year.
 - We have had an active program of section activities, particularly focused on Chapter activities to encourage more participation by members with specialist interests.
 - We have had a strong program within the two universities associated with the section, particularly with postgraduate students. This is reflected in the strong participation with the joint Postgraduate Symposium, which is a whole day event. However, for undergraduate students, the local university engineering societies are more visible, and we need to better coordinate with them.
 - We have active representation from industry on the committee.

B.2 Chapter Activities

- Total number of Chapters in the Section: Five
 - Chapter of the Computational Intelligence Society
 - Chapter of the Power and Energy Society
 - Joint Chapter of the IEEE Communications Society (joint with NZ North and NZ South)
 - Joint Chapter of the IEEE Instrumentation and Measurement Society (joint with NZ North and NZ South)
 - Joint Chapter of the Signal Processing and Information Technology Societies (joint with NZ North and NZ South)
- Number of Chapters formed in the current year
 - None
- Number of active Chapters (Chapters who have reported required number of meetings during the year)
 - Five
- Summary of Chapter activities (Chapter wise with attachment table/information)
 - See above

B.3 Professional and Continuing Education Activities

Summary of continuing Educational activities including conferences, technical activities, training courses, and distinguished lecture programs with attachment table / information.

- 20 February 2021: IEEE-IQRA Community Workshop. This is a follow up IEEE-IQRA community workshop from the last three successful ones. This workshop aims to provide an overview of “Emerging Technologies for Humanities” to enhance students’ learning and comprehension.
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Facebook, Twitter, LinkedIn, YouTube, etc.) so that people across the globe will be aware of our good work that we are doing in NZ.

- 29 May 2021: 2021 ComSoc VDL Series: We have had an excellent VDL lecture by Prof Misra today (4 pm NZ time). The talk went very well. We started at 3.45pm and finished at around 5.15pm. We really enjoyed the lecture and learned more about UAV Networks, Architectures/topologies, applications, design issues and challenges. A short prototype video associated with his work at SWAN Lab (IIT Kharagpur India) was presented. We thank Prof Sudip Mishra for his valuable time especially weekend to give a talk. Thanks go to participants for their support and to make the event a grand success. We also thank IEEE ComSoc for their approval, financial and logistic support. Despite of the busy time of the year, about 23 participants attended the event. We had Q/A after the lecture. We received positive feedback from the audience indicating that the VDL event was successful.
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B.4 Students Activities

- Total number of Student Branches in the Section
 - Two – Massey University and Victoria University of Wellington
- Number of new Student Branches formed in the current year
 - None
- Section level student activities (student congress, paper and other contests, awards etc)
 - 26 November 2021: The IEEE Postgraduate Symposium was held at Victoria University of Wellington in Kelburn, Wellington. This event involved presentations from 30 PhD students from Victoria University of Wellington and Massey University (Palmerston North) to present their research work. In addition, there were approximately 40 fellow students who enjoyed the presentations. The three best presentations were recognised and awarded with prizes.
- Number of active Student Branches (Student Branches who have reported required number of meetings during the year)
 - Two
- Summary of Student Branch activities (Student Branch wise with attachment table/information)
 - As per above.

B.5 Affinity Group Activities

- **Young Professional (YP)**
During 2021, the following events and activities have been organised:
 - 13 May 2021: Organisation of a hybrid YP seminar event on “Success After Graduation”. The event was held in Victoria University of Wellington along with livestreaming via Zoom. There were four speakers, each gave a short talk from different perspectives, followed by a Q/A session and networking with finger food. There were about 30 attendees. The cost was about \$300NZD, fully supported by the Section.
 - Provision of support for the Massey University and Victoria University of Wellington Student Branches for the preparation of their Postgraduate Symposium (see below).

- Participation in the Joint Institutions Breakfast Seminar (see below).
- 27 September 2021: Participation and provision of support for the Joint WIE virtual networking and Webinar event on “Stress Management and Mental Wellness” (New Zealand Central and New South Wales WIE Affinity Groups).
- **Women In Engineering (WIE)**
In 2021, the WIE group has undertaken the following activities:
 - 14 September 2021: Organisation of the Joint virtual networking activities together with the Australia New South Wales WIE Group.
 - 27 September 2021: Organisation of the Joint WIE virtual networking and Webinar event on “Stress Management and Mental Wellness”, together with Australia New South Wales Section WIE Group.
 - 25 October 2021: Co-organise the Joint WIE Tech Talk Series – IMS Insights into Intelligent System Deployment, together with Australia New South Wales Section WIE Group. The talk was given by the invited speaker Dr. Melanie Ooi, Associate Professor of University of Waikato, NZ.
 - 29 November 2021: Co-organise the virtual event “navigating competitive grant application processes” together with Australia New South Wales Section WIE Group and YP Group. The event invited Roba Abbass (Lecturer in University of Wollongong) and Katina Michael (Professor in Arizona State University) to give presentations.
 - Provision of support for the Massey University and Victoria University of Wellington Student Branches for the preparation of their Postgraduate Symposium (see below).
 - Participation in the Joint Institutions Breakfast Seminar (see below).
- **Life Member (LM)**
 - The Section has seen a growth in Life Members over the last year and we expect this trend to continue as our membership ages.

B.6 Awards & Recognition Activities

- **Award constituted by the Section**
 - The key awards constituted by the Section are those in support of the Postgraduate Symposium.
 - These awards for best presentation are presented each year at the Symposium.
- **Please list all Awards and Recognitions received by the Section, and members in the Section, from R10 and IEEE HQ during the year**
 - R10 Best Membership Retention Small Section Award 2021

B.7 Communication Activities (Newsletter, Home Page, E-mail etc.)

- Newsletter (name and number of issues in the year)
 - Not Applicable
- Home Page of the Section (give the URL and how often it is updated)
 - The Section website is updated regularly with activity information, both as announcements of upcoming events, and reports on the events as they happen. The URL is <http://www.ewh.ieee.org/r10/nzc/>
 - The website is kept regularly up to date by our very active webmaster Professor Richard Harris – Richard ensures that all activities involving the Section are recorded on the website in a timely manner and he frequently chases committee members to ensure that reports on recent events are recorded quickly, with photos where possible.
- Other means of contacts with Section members including social media
 - Members are notified of upcoming events through e-notices.

B.8 Industry Relations

- Membership growth and retention
 - Unfortunately our Industry Coordinator left to Melbourne, Australia in 2021, which affected our industry-related activities very much. We have been trying to find new Industry Coordinators, and finally found a succession in the AGM in November 2021. We expect to organise more activities with our new Industry Coordinator (Sanjib Mishra) in 2022.

- Our Young Professional Coordinator, Bach Hoai Nguyen, has also established good relationship with the Engineering New Zealand YP Coordinator from previous YP events. We expect to have more jointly organised events in 2022.
- Activities for/with industrial members
 - This year we successfully held it as an in-person event, despite the challenging situation of the ever-changing NZ COVID-19 Alert Levels and restrictions on physical distances. The event was held on 28 October 2021, at Wellesley Boutique Hotel (our usual venue), with 32 people in attendance from IEEE, ENZ, IET and outside.
We invited John Clarke, a General Manager in Transpower, New Zealand, to give a presentation on “Sustainable Energy Future Enabling electrification of the NZ economy supported by renewable generation”. The presentation went very well. John introduced a range of significant projects for decarbonization that Transpower is working on towards zero emission and their challenges. This was followed by a Q&A session, when John answered the questions from the audience and the audience voted for the top three most important directions towards zero emission from the 10 options John provided. There was a very high engagement throughout the event. The cost for this event is distributed between the attendees and each of the three participating Institutions which resulted in a cost of under NZD300 for IEEE NZCS. This is an excellent event for sharing between institutions and for engagement with industry.
 - We organised a Joint Institution Event on “Considerations when specifying distribution transformers in the future” in September 2021, together with Engineering New Zealand (ENZ) and Institution of Engineering and Technology (IET). ETEL’s Innovation Manager Dr Dan Martin gave a presentation on what to consider when specifying distribution transformers for the future. At least 36 people indicated that they were members of IET and/or IEEE and attended the event. Overall, it was a very successful event as there were a total of 231 people who registered to hear this interesting talk by the speaker which was conducted virtually due to Covid restrictions.
 - We organised a Joint Institution Event on “Sounds Air: Electric Aircraft and their Journey” in July 2021, together with Engineering New Zealand (ENZ), Institution of Engineering and Technology (IET) and Royal Aeronautical Society (RAEs). Rhyan Wardman, Board Chairman and Director of Sounds Air, present to us on their journey to date with Heart Aerospace and the very real opportunity to put New Zealand at the forefront of sustainable air travel. Following the presentation Rhyan will be available to take questions. The event started at 5:00pm with drinks and nibbles, with the presentation starting at 5:30pm sharp. Around 70 people participated in person and over 250 in total including virtual attendees. It is hoped that the speaker might be available next year to update us on developments in this very interesting and fascinating area.
 - In July 2021, the IEEE Central Section is delighted to collaborate with the IET in joining them for this Lighting Trade Show Event.
 - In November 2021, our Section co-organised an informative presentation by EECA on how the State Sector Decarbonisation fund is helping deliver a carbon neutral New Zealand, given by Paul Bull. 35 people attended this event.

B.9 Humanitarian Technology Activities

- Humanitarian Technology related activities supported by the Section including collaboration with other OUs.
 - None
- SIGHT Activities
 - None

B.10 Community Activities

- IEEE Social activities (Family day, IEEE day, Engineers Week)”
 - We had a BBQ networking event on 30 January 2021. The event was held at the Milner Consulting Ltd, 21 Rangatira Road, Tawa, Wellington, with 11 committee members (including 4 new committee members) involved together with some of their partners and children. The BBQ food was prepared by the Milner Consulting Ltd (in particular Murray Milner, the Immediate-past Chair). Everyone presented enjoyed the gathering, food, and social conversations. The cost for this event was around \$450NZD, sponsored by the Section.
 - We had a dinner networking event along with the AGM in November 2021 (co-sponsored with the Computational Intelligence Society Chapter). We invited all the students who attended the

IEEE Postgraduate Symposium to the networking event. About 40 people attended the event, and everyone had a very good communication there.

PART C - OTHERS

C.1 Special Events

- The primary Special Event held during 2021 was the Combined Institutions Breakfast Symposium. This event included joint sponsorship from IEEE, IET and ENZ. The event was also jointly funded by the three institutions.
- We have successfully transitioned to the new financial system of IEEE and found the most economical way to adapt. Now we are operating two bank accounts, where our New Zealand local bank account (Westpac) is used for most operations, as the transaction fee is low for the local bank account. The CB Account (NextGen) is mainly used for international transactions such as receiving the incentives/funds from IEEE headquarters and R10. We occasionally transfer from the NextGen account to our local Westpac account to support our daily operational uses.

C.2 Relationship with National and International Societies and Non-Government Organizations (NGO)

- Nature of relationship and details of any formal agreement signed
 - Engineering New Zealand (ENZ)
 - Collaboration Agreement signed some years back, and needs to be renewed. We have started communicating with ENZ in 2020, but the progress is slow due to the negative effect caused by COVID-19. We have tried our best under the constraint of COVID-19, and will continue the process in the new year.
 - Joint events held annually
 - Considerable overlap in membership
 - Institute of Engineering and Technology (IET)
 - Collaboration Agreement signed some years back, and needs to be renewed. We have started the communication with IET, and received a very positive response from IET who have agreed the renewal in principle and are keen to develop closer relationships especially in regard to YP activities. However, again due to COVID-19, the progress is a bit slow. We will continue the process on the agreement renewal and closer collaboration with IET in the new year.
 - IEEE NZCS Secretary (and Immediate Past Chair) is also an IET Wellington Network Committee member
 - Considerable overlap in membership
 - Several joint events held annually
- Details of joint activities
 - Primary joint event with ENZ and IET held annually is the Combined Institutions Breakfast event.
 - Other events held on a collaborative basis as appropriate.
- Benefit to IEEE members (for example discounts, access to technical information etc.)
 - IEEE members get to access technical seminars and other events which would not be otherwise possible without multiple membership fees
- Benefit to Section (for example help in membership development, venue facilities, cost saving etc.)
 - Greatly increased range of activities for members with less organizational effort
 - Leverage the scale and scope of three organizations for the benefit of members
 - Reduces competition for members between these three organizations

C3. Collaboration with other IEEE Sections

- Support extended to neighboring Sections
 - Many activities are undertaken collaboratively with the New Zealand North and South Sections

- Several Chapters are Joint with the North and/or South Sections in order to ensure scale and scope of activities.
- Joint activities with any other Section
 - 20 February 2021: IEEE-IQRA Community Workshop by the Joint Communications Society Chapter with NZ North and South Sections.
 - 29 May 2021: ComSoc VDL Series by the Joint Communications Society Chapter with NZ North and South Sections.
 - 17 June 2021: ComSoc VDL Series by the Joint Communications Society Chapter with NZ North and South Sections.
 - 8 July 2021: ComSoc VDL Series by the Joint Communications Society Chapter with NZ North and South Sections.
 - 14 September 2021: Joint virtual networking activities together with the Australia New South Wales WIE Group.
 - 27 September 2021: Joint WIE virtual networking and Webinar event on “Stress Management and Mental Wellness”, together with Australia New South Wales Section WIE Group.
 - 25 October 2021: Joint WIE Tech Talk Series – IMS Insights into Intelligent System Deployment, together with Australia New South Wales Section WIE Group.
 - 29 November 2021: Virtual event “navigating competitive grant application processes” together with Australia New South Wales Section WIE Group and YP Group.

C.4 Support extended to Sub-sections & Society Chapters within the Section

- Support extended for organizing technical, educational and professional activities
 - There are no sub-sections within the New Zealand Central Section
 - The NZCS always works to support Society Chapters in a collaborative manner with funding as required.
 - All Chairs of Chapters and Joint Chapters are invited to participate in monthly Section Committee meetings.
- Joint activities for membership development
 - Society Chapter Chairs are involved in all membership development activities undertaken by the Section.
- Support extended for the formation of a Sub-section or transition of a Sub-section into a full Section
 - Not applicable

C.5 Best Practices of your Section (which you would like to share with other Sections for the benefits of members)

- Maintaining regular (monthly) committee meetings.
- We have defined a “Portfolio responsibilities” document, which outlines the roles and responsibilities for the various portfolios on the executive committee.
- Close coordination of activities with those of affiliated groups such as Engineering New Zealand and Institute of Engineering and Technology.
- The New Zealand Central Section has two annual activities which we believe represent best practice. These are:
 - An annual industry breakfast seminar event which is held jointly with the local IET network and the Wellington Branch of Engineering New Zealand. This event is especially targeted at industry members from all three Institutions. It also provides an excellent platform for collaboration with our sister professional institutions operation in our region.
 - The annual Postgraduate Symposium which involves participation across the two postgraduate universities within the Central Region and typically has around 20 participants from each University. Prizes are awarded for the best presentations, but the greatest value is derived from the sharing of research activities from across the region.

C.6 Problems anticipated and suggestions for solutions, if any

- New Zealand like many countries has a national engineering institution which in our case is called Engineering New Zealand.

- As Engineering becomes increasingly recognised as a critical discipline for the delivery of safe modern facilities, the requirements placed on engineers to ensure Continuous Professional Development and up to date competency in one's fields of practice increases to the extent that it becomes a matter of Regulatory Compliance,
- The Regulatory Compliance aspect is typically associated with membership and competency evaluation through the national engineering institution, which requires membership of Engineering New Zealand.
- The threat for IEEE is that increasingly engineers must join their national engineering institution to ensure Regulatory Compliance to practice engineering nationally which then puts pressure on funding to also join other institutions such as IEEE.
- This is becoming an increasing competitive threat to institutions such as IEEE and IET in New Zealand.
- It is highly likely that some form of joint membership will be essential in the future, which enables membership of ENZ and IEEE (say) at a reduced rate relative to joining each institution separately. Our Secretary Murray Milner is a Distinguished Fellow of ENZ, and our CIS Chapter Chair (and student councilor) Mengjie Zhang is just elected as a Fellow of ENZ. We will continue to apply for more ENZ Fellowship from the IEEE Committees to increase our engagement and influence to the ENZ decisions and planning.
- Maintaining dynamism within the student branches, especially with a high turnover (students are only with us for a short time). We need to focus on the attraction and retention of members within our two student branches.
- Due to COVID-19, it is harder to organise in-person events, and virtual events cannot achieve as good experience as the physical ones. We will continue to explore better virtual event tools/apps to increase the experiment of virtual events.
- Due to COVID-19, the membership had a reduction across the Section due to some members losing their jobs and students having a disrupted year of studies.

PART D - GOALS AND PLANS

D.1 Continuation of project/activity in progress and their implementation plans

- Ongoing plans for 2022
 - Continue to organise our very successful joint institutions breakfast meeting for industry.
 - Continue with the successful postgraduate presentation event.
 - Continue to encourage Distinguished Lecturers to present to our members.
 - Continue to send introductory letters to all new members within the Central Region.

D.2 Goals and Future Plans

- Goals
 - To increase membership in all disciplines.
 - To encourage members to enhance their membership level.
 - To actively engage with all members within the Central Region.
 - To further encourage YP and WIE activities.
- Future Plans
 - To determine what will encourage members to participate in events.
 - To structure a program of events to best match members' needs.
 - To invite more committee members from industry.

D.3 Any innovative ideas to make IEEE more creative and value added for sustaining the membership retention and recruitment goals.

- As indicated in Section C6 above, it is becoming increasingly essential to find improved ways to work collaboratively with our national engineering institution, Engineering New Zealand, so that members are not unduly burdened with membership fees for both organizations.
- If we don't find a way to do this, the Regulatory Compliance requirements will ensure that ENZ gets membership priority over IEEE.

D.4 Business Plan for Sustainable Growth and Financial Stability.

- New Zealand has its summer holidays during December and January and so Business Planning for the New Year will commence in February 2022.
- Hence the Business Plan for 2022 is at an early stage of development for this report.
- It is expected that the Business Plan will continue the work from previous years as follows:
 - Continued support of Chapter seminars and related activities with particular emphasis on Distinguished Lectures,
 - The holding of the annual Combined Institutions Industry Breakfast event,
 - The holding of the Postgraduate Presentation Symposium by the Combined Student Branches,
 - A continued emphasis on membership development and retention, noting the challenges identified in C.6 above,
 - Increased focus on Affinity Groups – finding ways to ensure continuity and growth of the Young Professionals Group and the Women in Engineering Group (we are fortunate in having an increased number of young women in the Section this year who are willing to take on more active roles).
 - We will continue to apply for more ENZ Fellowship to make more engagement and influence on the ENZ decisions, to make it possible for more deep collaborations (e.g., joint membership) with ENZ.
 - We will establish special funds to encourage people to organise events and provide financial support and sponsorship to them. This way, we expect to increase the visibility and influence of our Section.