IEEE Fellow Activities and Industry Engagement

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President, IEEE Transportation Electrification Council, 2024-
Chair, IEEE Fellow Committee, IEEE Board of Directors, 2022-2023
Division II Director, IEEE Board of Directors, 2017-2018
Editor-in-Chief (Founding), IEEE JESTPE, 2013-2018
President, IEEE Power Electronics Society, 2013-2014
Chair, IEEE/Google Little Box Challenge ($1M Awarded), 2014-2015
Chair, IEEE std 1515 & 1573 Working Groups, 1997-2004
Chair, IEEE PELS LAC Chapter, 1995-1999

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TPES
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IEEE Signal Processing Society
IEEE TRANSPORTATION ELECTRIFICATION COUNCIL
ies
IAS IEEE INDUSTRY APPLICATIONS SOCIETY Linking Research to Practice

Outline

- Recent fellow stats
- The new contribution characterization matrix
- Advanced glimpse of the sample nom form write-ups
- Importance of increasing the nomination pool size
- Nomination committees
- Synergy with senior member drive

New FC Structure

- The BoD approved the new structure for the Fellow Committee Nov., 2023

2023 and 2024 Stats

- Class of 2023 & Class of 2024*

2023	R10	R1-R7	R8	R9	Industry	Female	
319	87	158	74	0	51	38	
994	337	445	204	8	157	108	
32.1%	25.8%	35.5%	36.3%	0.0%	32.5%	35.2%	

2024	R10	R1-R7	R8	R9	Industry	Female	STDC
323	97	163	61	2	73	35	6
949	340	404	194	11	187	87	13
34.0%	28.5%	40.3%	31.4%	18.2%	39.0%	40.2%	46.2%

* - The elevation metrics are pointing to the right direction, but clas-of-2024's female nomination number was lower

Class of 2024 Stats

- By Employment Affiliation*

Class of	NOMINATIONS RECEIVED Education	Government	Industry	Other	Total	NOMINATIONS ELEVATED Education	Government	Industry	Other	Total
1999	303	28	207	26	564	132	13	83	11	239
2000	297	11	206	17	531	133	7	103	5	248
2001	277	28	209	11	525	139	13	98	6	256
2002	327	38	171	25	561	143	14	91	11	259
2003	406	45	166	12	629	165	14	76	5	260
2004	432	45	179	19	675	150	22	82	6	260
2005	496	60	200	22	778	176	23	58	11	268
2006	501	60	194	30	785	173	17	69	12	271
2007	526	65	166	8	765	167	27	71	3	268
2008	501	51	204	17	773	188	17	84	6	295
2009	512	48	182	15	757	204	15	78	5	302
2010	542	43	187	25	797	206	17	72	14	309
2011	553	55	188	17	813	211	18	85	7	321
2012	568	55	164	12	799	234	19	71	5	329
2013	566	65	182	18	831	191	24	77	5	297
2014	589	54	193	16	852	192	23	67	11	293
2015	619	52	190	13	874	211	21	65	3	300
2016	592	55	172	14	833	219	21	55	2	297
2017	686	60	184	14	944	223	17	54	5	299
2018	672	58	175	14	919	209	21	63	3	296
2019	660	50	190	14	914	208	14	71	2	295
2020	713	56	188	21	978	207	13	56	6	282
2021	675	50	198	13	936	207	7	60	8	282
2022	745	64	202	18	1029	197	25	84	5	311
2023	760	58	157	19	994	242	17	51	9	319
2024	699	51	187	12	949	230	17	73	3	323

* - The total nominations were trending down in recent years

Class of 2024 Stats

- By Employment Affiliation*

EDUCATION			
Class of	Education Received	Education Elevated	% Success
1999	303	132	43.6%
2000	297	133	44.8%
2001	277	139	50.2%
2002	327	143	43.7%
2003	406	165	40.6%
2004	432	150	34.7%
2005	496	176	35.5%
2006	501	173	34.5%
2007	526	167	31.7%
2008	501	188	37.5%
2009	512	204	39.8%
2010	542	206	38.0%
2011	553	211	38.2%
2012	568	234	41.2%
2013	566	191	33.7%
2014	589	192	32.6%
2015	619	211	34.1%
2016	592	219	37.0%
2017	686	223	32.5%
2018	672	209	31.1%
2019	660	208	31.5%
2020	713	207	29.0%
2021	675	207	30.7%
2022	745	197	26.4%
2023	760	242	31.8%
2024	699	230	32.9%

INDUSTRY			
Class of	Industry Received	Industry Elevated	% Success
1999	207	83	40.1%
2000	206	103	50.0%
2001	209	98	46.9%
2002	171	91	53.2%
2003	166	76	45.8%
2004	179	82	45.8%
2005	200	58	29.0%
2006	194	69	35.6%
2007	166	71	42.8%
2008	204	84	41.2%
2009	182	78	42.9%
2010	187	72	38.5%
2011	188	85	45.2%
2012	164	71	43.3%
2013	182	77	42.3%
2014	193	67	34.7%
2015	190	65	34.2%
2016	172	55	32.0%
2017	184	54	29.3%
2018	175	63	36.0%
2019	190	71	37.4%
2020	188	56	29.8%
2021	198	60	30.3%
2022	202	84	41.6%
2023	157	51	32.5%
2024	187	73	39.0%

GOVERNMENT			
Class of	Government Received	Government Elevated	% Success
1999	28	13	46.4%
2000	11	7	63.6%
2001	28	13	46.4%
2002	38	14	36.8%
2003	45	14	31.1%
2004	45	22	48.9%
2005	60	23	38.3%
2006	60	17	28.3%
2007	65	27	41.5%
2008	51	17	33.3%
2009	48	15	31.3%
2010	43	17	39.5%
2011	55	18	32.7%
2012	55	19	34.5%
2013	65	24	36.9%
2014	54	23	42.6%
2015	52	21	40.4%
2016	55	21	38.2%
2017	60	17	28.3%
2018	58	21	36.2%
2019	50	14	28.0%
2020	56	13	23.2%
2021	50	7	14.0%
2022	64	25	39.1%
2023	58	17	29.3%
2024	51	17	33.3%

OTHER			
Class of	Other Received	Other Elevated	% Success
1999	26	11	42.3%
2000	17	5	29.4%
2001	11	6	54.5%
2002	25	11	44.0%
2003	12	5	41.7%
2004	19	6	31.6%
2005	22	11	50.0%
2006	30	12	40.0%
2007	8	3	37.5%
2008	17	6	35.3%
2009	15	5	33.3%
2010	25	14	56.0%
2011	17	7	41.2%
2012	12	5	41.7%
2013	18	5	27.8%
2014	16	11	68.8%
2015	13	3	23.1%
2016	14	2	14.3%
2017	14	5	35.7%
2018	14	3	21.4%
2019	14	2	14.3%
2020	21	6	28.6%
2021	13	8	61.5%
2022	18	5	27.8%
2023	19	9	47.4%
2024	12	3	25.0%

* - Academic nominations are doubled, while industry nominations were stagnant

Class of 2024 Stats

- By Region Affiliation

2024 fellow stats by regions

Evaluated in 2023 for Elevation on 1 January 2024

Total Voting Membership:	328,953
Number of Fellows	8,426
Total Nominations Received	949
Total Nominees Elevated	323
% success	34.0%

	Voting Membership	Nominations Received	Nominees Elevated	% of Total Voting Membership	% of Total Nominations Received	% of Total Nominees Elevated	% Success
Regions 1-6 (U.S.)	142,099	363	145	43.2%	38.3%	44.9%	39.9%
Region 7 (Canada)	13,093	44	21	4.0%	13.6%	6.5%	47.7%
Region 8 (Europe, Mid East, Africa)	59,450	191	61	18.1%	20.1%	18.9%	31.9%
Region 9 (Latin America)	10,188	11	2	3.1%	1.2%	0.6%	18.2%
Region 10 (Asia and Pacific)	102,967	340	94	31.3%	35.8%	29.1%	27.6%
Total	327,797	949	323	99.6%	100.0%	100.0%	34.0%

Class of 2024 Stats

- Women Elevations

Year Elevated	Total Nominations Received	Women Nominations Received	Number of Women Elevated	% Success
1999	566	21	13	61.9%
2000	531	6	2	33.3%
2001	525	17	5	29.4%
2002	561	28	13	46.4%
2003	629	32	14	43.8%
2004	675	36	6	16.7%
2005	778	46	17	37.0%
2006	785	44	7	15.9%
2007	765	48	18	37.5%
2008	773	47	27	57.4%
2009	757	46	19	41.3%
2010	797	57	22	38.6%
2011	813	52	29	55.8%
2012	799	52	23	44.2%
2013	831	56	19	33.9%
2014	852	61	19	31.1%
2015	874	59	26	44.0%
2016	833	60	23	38.0%
2017	944	80	28	35.0%
2018	919	75	35	46.7%
2019	914	71	23	32.4%
2020	978	93	37	39.8%
2021	936	85	39	45.8%
2022	1029	99	35	35.3%
2023	994	100	34	34.0%
2024	949	85	33	38.8%

Technical Diversity: New Contribution Characterization Matrix

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	Evidence Domains				
	Research Publications	**Peer-Reviewed Materials**	**Designs, Products, Processes, Algorithms, Systems, and Public/Industrial Contributions**	**Patents/Trade Secrets**	**Standards**
Generic Defini-tion/ Ex-amples	Scholarly cited articles, refereed papers in archival journals (not survey papers), edited or authored books, papers in technical reports or other refereed publications.	Tutorials, survey papers, position papers, white papers, articles in popular press, internal reports, books about practice in the field, design review packages, and other documents describing the development/ application of products, systems, facilities, services, or software.	Contributions that demonstrate development of industrial/public systems, deployments, and innovations. Examples include building and habitation, space, utilities infrastructure, social networking, telecommunications, devices, solid state technologies.	Any type of document or legal arrangement protecting Intellectual Property.	Contributions that 1) define the framework, reference, functional or design architectures for a standard or family of standards, 2) demonstrate strong technical skills in leading a standards project or task, 3) demonstrate direct or indirect original technical content in a standard project that is adopted into a published standard or widely accepted specifications.
RE/S	**Contributions in this Category normally have significant evidence from this Domain.** Role of nominee in articles' authorship and impact on: - future research directions or commercialization, - literature (article citations), - technology (patent or standards citations), - society at-large (articles in popular press). Endorsements may provide documentation for proprietary or classified contributions.	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**	**Contributions in this Category typically do not have evidence from this Domain.**	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**	**Contributions in this Category typically do not have evidence from this Domain.**
TI	**Contributions in this Category commonly do not have evidence from this Domain.**	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**	**Contributions in this Category normally have significant evidence from this Domain.** - Individual role of the nominee in the team/initiative (if any) - Technical contribution or innovation, risk involved, performance improvement, economic results, or other advantages - Level of adoption of the reduction	**Contributions in this Category normally have significant evidence from this Domain.** Evidence of contribution and impact is similar to that of contributions from Designs, Products, Processes Algorithms, Systems, and Public/Industrial	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**

Contribution matrix 20230506

The new contribution matrix can level the playing field to enhance technical diversity!

Technical Diversity: New Contribution Characterization Matrix

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	Research Publications	Peer-Reviewed Materials	Designs, Products, Processes, Algorithms, Systems, and Public/Industrial Contributions	Patents/Trade Secrets	Standards
TL	**Contributions in this Category commonly do not have evidence from this Domain.**	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**	**Contributions in this Category normally have significant evidence from this Domain.** - Role of the nominee in the technical leadership of a team, company, or industry-wide effort; not solely managerial position. - Technical contribution or innovation, risk involved, performance improvement, economic results, or other advantages - Level of adoption of the technical contribution - Financial impact of the technical contribution, e.g., generated revenues, costs reduction Endorsements may provide documentation for proprietary or classified contributions.	**Contributions in this Category normally have significant evidence from this Domain.** Patents and trade secrets can have impacts similar to those in Designs, Products, Processes, Algorithms, Systems, and Public/Industrial Contributions. In this case, the role of the patent(s) in the contribution impact should be highlighted along with how Technical Leadership is demonstrated.	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance-impact should NOT be penalized by the absence of evidence from this Domain.**
EDU	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance/impact should NOT be penalized by the absence of evidence from this Domain.** However, formal educational research (e.g., pedagogy, assessment, curricula) published in engineering education journals may be strongly supportive. Research publications in other technical areas generally are not evidence of contribution.	**Contributions in this Category normally have significant evidence from this Domain.** Contributions may include widely used pioneering texts, laboratory experiments, papers on engineering education practice. Evidence of impact can include: - Adoption of textbooks, new curricula or courseware, MOOC courses, TED presentations. - Level of outreach to underrepresented populations, and/or regions.	**Contributions in this Category commonly do not have evidence from this Domain.**	**Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance/impact should NOT be penalized by the absence of evidence from this Domain.**	**Contributions in this Category commonly do not have evidence from this Domain.**

Technical Diversity: New Contribution Characterization Matrix

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	Research Publications	Peer-Reviewed Materials	Designs, Products, Processes, Algorithms, Systems, and Public/Industrial Contributions	Patents/Trade Secrets	Standards
STD C	Contributions in this Category commonly do not have evidence from this Domain.	Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance/impact should NOT be penalized by the absence of evidence from this Domain.	Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance/impact should NOT be penalized by the absence of evidence from this Domain.	Contributions in this Category may be supported by evidence from this Domain, but such evidence is not normally expected. Significance/impact should NOT be penalized by the absence of evidence from this Domain.	**Contributions in this Category normally have significant evidence from this Domain.** Evidence of impact for a Standards Contribution is generally more extensive than evidence in other Contribution Categories. Documentation of the contribution may use IEEE SA Contributor Collection, Internet Engineering Task Force's (IETF's) RFC, and/or other Standards Development Organizations' or alliances' publications certifying individual contributions or working group meeting minutes. Impact includes: 1) Nominee's impact on the standard, as assessed by reference and endorser testimony, related publications and patent activity, IEEE, or other awards with citations to the relevant standard, degree of incorporation of the task or project into a standard, nominee's recognized technical stature in the field and peer-recognized authority in the standard's Working Group. 2) Broader impacts of the standard, which includes functional, scientific, economic, market and societal aspects.

Sample Nomination Form

- In final preparation

Sample nom form write-ups

Example 6: Technical Leader

6.a. Identify the individual contribution which qualifies the Nominee for Fellow grade (max 200 words).	**6.b. Verifiable Evidence of contribution** (max 400 words)	**6.c. Impact of contribution** (max 400 words)	**6.d. Verifiable Evidence of Impact** (max 200 words)
Steve Wozniak was the inventor of the Apple I computer, and along with Steve Jobs, founded the Apple Computer Company in 1976 to manufacture the Apple I computer. Along with the Apple II computer, which Steve also designed, these computers were the first broadly available personal computers. Many of the elements now common to all personal computers were first demonstrated in the Apple I and II computers. The Apple I, Apple II, and the Apple Macintosh computers are designated IEEE Engineering Milestones for their pioneering contributions to computing.	1) US Patent No. 4,136,359, Stephen Wozniak, issued Jan. 23, 1979: Microcomputer for Use with Video Display. 2) US Patent No. 4,210,959, Stephen Wozniak, issued Jul. 1, 1980: Controller for magnetic disc, recorder, or the like. The features essential for a personal computer were first encompassed by the Apple I and designed by Steve Wozniak. The Apple I defined the elements of a personal computer, thus making it affordable and useful for "normal" people. The cost reductions that made this possible were 1) an integrated and fully assembled working computer circuit board based on the powerful 1-MHz 6,502 microprocessor, 2) state-of-the-art but low-cost DRAM, 3) the clever sharing of components, 4) the use of a typewriter-style keyboard to replace the front panel, and 5) NTSC output to an owner's existing TV. The Apple I was thus able to realize the goal of a low-cost, easy-to-use personal computer a fully-assembled circuit board with dynamic RAM, video interface, keyboard, mass storage, operating system and a high-level programming language. This affordable computer platform triggered a software industry that grew as the sophistication of these essential features grew, and the Apple I thus helped launch the personal computer revolution. 3) US Patent No. 4,217,604, Stephen Wozniak, received Aug. 12, 1980: Apparatus for digitally controlling PAL color display 4) US Patent No. 4,278,972, Stephen Wozniak, received Jul. 14, 1981: Digitally-controlled color signal generation means for use with display The Apple II was the first low-cost computer to offer quick start-up, pre-addressed standard expansion slots, processor RAM-based bit-mapped NTSC color graphics and random-access storage in a compact package and was designed by Steve Wozniak, except for the computer case and switching power supply. Combined with a BASIC interpreter and assembler in ROM, gaming and graphics features, and an economy of design, this device spurred software and hardware suppliers to help create the worldwide personal computing industry. From its introduction in 1977 to the final production of the Apple II computer in 1993, 5-6 million Apple II computers were sold. The Apple II computer series was one of the longest running personal computer products (17 years).	Prior to the Apple I, hobbyist computers were sold as kits that included components from different companies. Early hobby computers were programmed with front-mounted toggle switches, and indicator lights on the front panel provided output. Separate hardware was required to allow connection to a computer terminal. The Apple I computer was the first product that was sold as a single assembled piece of computer hardware that could be easily used in the home and that was marketed as a personal computer. Unlike earlier hobbyist computers, the Apple I was sold as a fully assembled circuit board containing more than 60 chips. The Apple II computer was the first broadly successful personal computer, and it helped to create the personal computer industry and future generations of microcomputer-based consumer electronic products. Unlike its predecessors, the Apple II was a complete system: it consisted of built-in input (keyboard, cassette interface, and game paddles), built-in output (color graphics, sound, and cassette interface), and built-in software that executed out of ROM (monitor, BASIC interpreter, and mini-assembler). All of these components were included in a small, portable case that was usable with a standard color television set, and was additionally easily and inexpensively expandable.	Today, Apple Computer, the company that Steve Wozniak and Steve Jobs founded in 1976 is one of the largest companies in the world. It has grown from its humble Apple I beginnings to a multinational technology company that designs, develops, and sells consumer electronics, computer software, and online services. It is considered one of the Big Tech technology companies. Its worldwide annual revenue totaled $265 billion for the 2018 fiscal year (see Endorsement by MM). As of January 2020, more than 1.5 billion Apple products are actively in use worldwide. The impact of Apple and its founders on the personal computer industry has been commemorated in numerous recent books including: 1) Revolution in the Valley, Andy Herztfeld, O'Reilly Media, October 2011 2) Fire in the Valley: The Birth and Death of the Personal Computer, Michael Swaine and Paul Freiberger, 3rd Edition, Pragmatic Bookshelf, October 2014. 3) The First Apple, Bob Luther, MassMedia mobi, August 2013.

Importance of Increasing the Nomination Pool Size

- All stats indicate that the most effective way to enhance technical, geographical diversity and DE&I is to increase the nomination pool size, particularly for those underrepresented areas/regions

The Fellow Nomination Committee

- The IEEE BoD requires every S/C establish a nomination committee for fellows
- Some regions have similar organization (R8 has a fellow committee)
- Recommend each region to establish such a committee

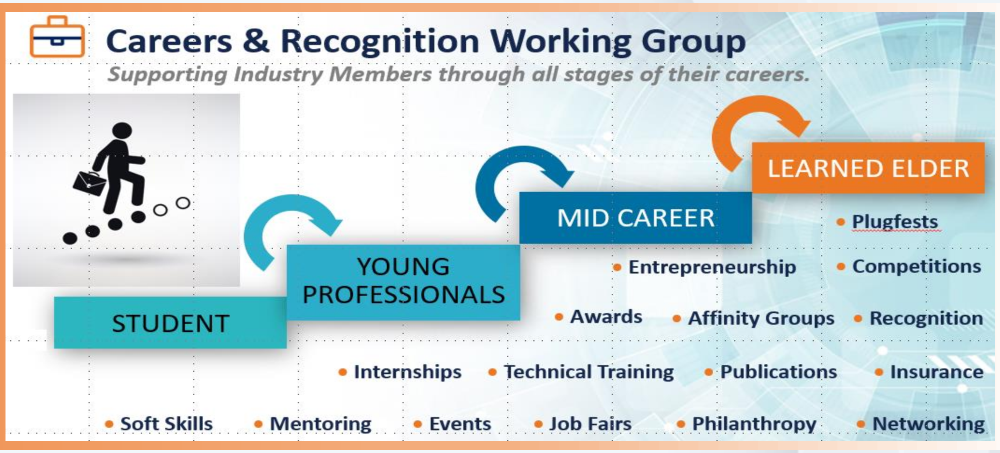
The Fellow Nomination Committee - Synergy

- Regional fellow nomination committees will be synergistic with current section practice for senior member drives

- The Fellow Advisory and Oversight Subcommittee (FAOS) can help in both (together with the IEC)

Best Practices - Careers & Recognition

Make IEEE the professional home for industry professionals adding value throughout their career. Enhance recognition to individuals and companies that have significant engagement and accomplishments within the scope of IEEE.



- **Work with MGA for Industry Senior Member Process Improvements**
  E.g., Senior Member Pilots: In-Company Elevation Drive and In-country Evaluation Panel
- **Work with IEEE Awards to Develop New Awards for Industry**
- **Work with IEEE Board of Directors and the IEEE Fellow Committee to Improve Process for Selection of Industry Fellows**

TEI to TEC (Community) Transition

- IEEE TEC followed from the Transportation Electrification Initiative
- The community was approved with only 7 sponsoring societies in 2014, operation started in January 1, 2015

IEEE

TEC Council MOU Signing, TAB Series, June 15, 2023

TEI to TEC (Community) Transition

Today, IEEE TEC is 18 societies strong!

Other supporting partners

THANK YOU

OBRIGADO gracias どうも ARIGATO hvala DANK U takk MERSI merci 謝謝 obrigado danke schön köszi PALDIES muchas gracias ありがとう TEŞEKKÜR EDERIM MOLTE GRAZIE GO RAIBH MAITH AGAT danke

grazas GRAZZI THANKS благодаря TAK どうも

qujan TAK благодаря asante muchas gracias vielen dank

PALDIES DANK U OBRIGADO mesi danke DANK U 감사합니다 köszi благодаря grazie TACK DZIEKI Gràcies спасибо MULTUMESC 多謝 TEŞEKKÜR EDERIM muchas gracias obrigado NA GODE