Relevance of First-Tier, Peer-Reviewed Journals in the Tenure and Promotion Process at Non-Doctoral Granting Engineering Institutions

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ABSTRACT

The IEEE (formerly the Institute of Electrical and Electronics Engineers) is the world's largest professional society dedicated to the advancement of technology. While it is indeed growing into multiple technology areas, the IEEE is still first an organization of electrical, electronics, and computer engineering professionals. It has over 400,000 members and publishes nearly 100, first-tier, peer-reviewed journals. As such a large purveyor of scholarly works, engineering faculty at almost all academic institutions (doctoral granting and non-doctoral granting) are familiar with the IEEE. For this reason, the IEEE makes an excellent case study for the relevance of first-tier, peer-reviewed journals in the tenure and promotion process at non-doctoral granting engineering institutions. In our work, we surveyed editors of the 97 IEEE journals. 93% of respondents indicated that 10% or less of their submissions were from non-academic institutions. None (0%) of the respondents believed that the number of non-doctoral granting institution submissions would be increasing over the next three years. In fact, a majority of the respondents (55%) see the number of non-doctoral granting institution submissions decreasing in the same time frame. To correlate this data, we examined a sample of 2,099 articles published in the first issue of each IEEE journal in 2009. 357 (17%) of these 2,099 articles were authored by individuals from academic institutions in the United States. Of the 357, only 35 were published by individuals from non-doctoral granting institutions (1.7%), with only 8 (0.38%) from institutions where a bachelor degree is the highest offered.

Keywords: Engineering, Journals, Peer Review, Tenure, Promotion.

1. INTRODUCTION

The IEEE (formerly known as the Institute of Electrical and Electronics Engineers) promotes itself as the world's largest professional society dedicated to the advancement of technology [1]. Its 2009 annual revenue (the latest year data is presently available) was over $389,000,000 (United States Dollars) [2]. The IEEE is comprised of over 407,000 [3] members with approximately 24% of its population in academia [2]. It publishes 97 separate scholarly, peer-reviewed journals with additional journals being added almost every year [4]. It is the leading publisher of scholarly work related to the electrical and computer engineering disciplines in the world. Most (if not all) of the IEEE's publications are considered to be of a "first-tier" status in the specific electrical and computer engineering disciplines [2]. As such, the number of publications a professor has in IEEE peer-reviewed journals is often used as a factor in his/her tenure and promotion decision process by the professoriate in electrical and engineering departments and schools.

However, there is a growing concern about the accessibility of IEEE peer-reviewed publications by non-doctoral granting institution prospective authors. Therefore, we have undertaken a 24 month study to the opportunity for non-doctoral granting prospective authors in IEEE journals today and determine the importance of IEEE peer-reviewed publications at non-doctoral granting institutions in the tenure and promotion process, and how the two are intertwined.

2. PROCEDURE

Contact Information

This project included multiple steps of research and analysis. First, we narrowed the scope of our investigation to the 97 actively publishing IEEE Transaction, Journals, and Letters. Five publications were not current, thus lowering the number from the original 102 to 97. We then collected the contact information for every Editor in Chief. When available we also included the contact information for any Assistant or Manager listed.

Survey

We then designed a survey to send to the Editors. We began writing the survey with a few general questions in mind. What do the Editors believe is the breakdown among international and domestic corporations, international and domestic schools, and doctoral, masters, or bachelor programs? Can the Editors predict an increasing or decreasing frequency in publications from any of these institutions? What are the expectations that Editors have for the quality of work they publish? The final draft of the survey is shown in Appendix 1. Only ten questions long, we hoped it would be simple and straightforward for busy Editors to fill out quickly. We designed the survey online at zoomerang.com [5], which enabled us to create a professional

looking survey, send it out in mass, and receive the data processed by the website.

Cover Letters

Before sending out the survey, we sent each Editor a personalized email explaining our purpose and explaining that a mass email with the survey link would follow. We hoped that these men and women would appreciate the time and effort we put forth by including their names and titles, and the title of the publication that they worked for at the top of the email. A day or two after the more personal cover letters went out we revamped the letter to be more concise and to include the survey link. Two weeks after we sent out the survey we revised and sent again the mass email and link—we had only received 17 responses.

Collecting and Analyzing Data

While we waited for the Editors to fill out the survey, we researched each of the 97 IEEE publications first issues of 2009 [6]. We used the IEEE Xplore Digital Library to view all 2,099 abstracts. These abstracts provide the authors name and the institution from which they work. Using this information we then created an Excel file entitled *IEEE Transactions, Journals, and Letters Author Information 2* (see example in Appendix 2). This file contains a worksheet for each of the publications. Each worksheet contains the same header including the publications title, its volume and issue number, and its frequency of publication (how many times a year it is published); the next four columns are entitled Unidentified, Domestic/International Corporations, Domestic Schools, and International Schools. We collected our data from the first issue of every publication in 2009 to provide a sort of consistency amongst our samples. Placing the article title, author, and location into the spreadsheet, and then categorizing each entry according to the aforementioned four columns the data was calculated quickly using the AutoSum formula. In total, the 929-page document provided the raw data for much of our work.

We created a second spreadsheet in Excel called *Totals*, which summarizes the data we collected in *IEEE Transactions, Journals, and Letters Author Information 2*. The *Totals* spreadsheet contains the breakdown for each publication. It is easy to see in this spreadsheet how many articles from each publication were unidentified (could not be categorized because of lack of information), domestic and international corporations, domestic schools, and international schools. The significance of this spreadsheet though comes at the bottom where we found the totals for each of these categories for all of the publications. These final totals are very important because they provide a basis for comparison:

- Total Articles   2,099

- Corporations   467
- Domestic Universities   357
- International Universities   1,140

Our next step was to isolate and research the articles written at the domestic schools to determine what the highest degree offered at each institution. The 357 articles were submitted by authors with 146 different affiliations. By consulting their institution websites, we were able to record which schools were

doctoral granting institutions, which schools had masters programs, and which were bachelor or associate programs.

3. ANALYSIS

There were pros and cons to working with the IEEE webpage. In the first week of compiling the Editor's information, we realized that the website had two lists of publications, though seemingly the same, one turned out to be far more extensive than the other was. Collecting the contact information from the publications individual links was a problem only when the IEEE had not kept the information updated. We received several emails in response to the personalized cover letter informing us that new Editors had taken over the position. Updating the contact list was a constant process because of this and a few incorrect email addresses; we also received emails from some Editors writing back asking to be taken off the correspondence list.

There were a few issues with the survey. Five editors did not receive surveys, four of them did not provide email address on the IEEE website, and one address repeatedly sent back an error. Respondents of the survey brought forth issues with the survey that had escaped us initially. As hard as we tried to cater to the convenience and perspective of the Editors, we did not have a true grasp on what their job really entailed. We received comments such as, "I don't have data for questions 6-10 so please disregard my answers" and "I'm just guessing at the percentages. I don't have statistics compiled on this information" and "Some of these questions can be interpreted in a couple ways."

A few Editors emailed back directly, they suggested we look at their instructions for authors. These documents simply provided insight to the strict particularities that authors must pay attention to before submitting a paper. One Editor introduced us to the company that facilitates the peer-editing process that makes these journals so prestigious. We also asked questions that authors themselves might be more able to answer than the Editors might. Questions concerning the length of time between submission review and resubmission, as one respondent pointed out, "depends on how long authors take to revise. Sometimes they take a long time." We acknowledged initially that many factors interplay here, but in writing the survey, we attempted to generalize the role of the authors, the Editor and the peer-review process too much.

We asked Editors to what percentage of submitted articles staff at non-educational institutions were writing, respondents reported from 2% to 50%. We asked the same question in regards to doctoral-granting institutions, and respondents reported from 20% to 100%. Their responses to this question regarding non-doctoral granting institutions fell between 1% and 50%. In short, Editors believe that most of their articles are coming primarily from doctoral-granting institutions, then from non-educational institutions, and the smallest margin from non-doctoral granting institutions (see Figure 1).

The data we collected from the IEEE publications corresponds with the estimates from the Editors. The 357 publications from domestic universities and colleges were divided into four categories based on the highest engineering degree offered at the institution. 90% of the publications (322) were from doctoral-granting institutions. Of the remaining 35 publications, 25 were

from masters level institutions, 8 bachelors institutions, and 2 associate institution (see Figure 2).
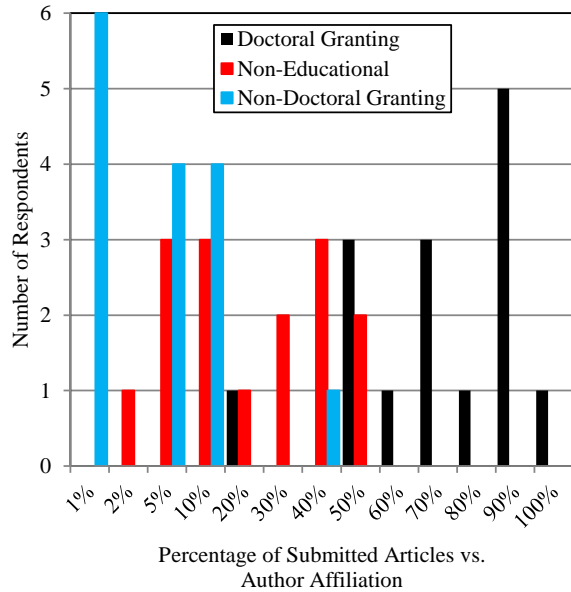

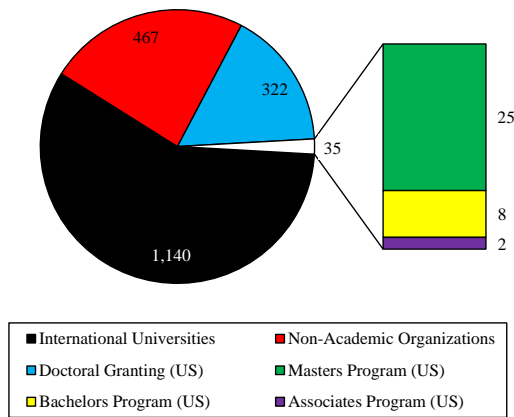Figure 1. Editor survey responses of author affiliation.

Figure 2. Author affiliation for 2,099 sample IEEE journal articles.

The survey asked Editors which sector of the industry they believed would increase articles submitted in the next three years, 79% said-doctoral granting institutions. Similarly, we asked which sector would be decreasing in the next three years, 55% said non-doctoral granting institutions. This leads us to believe that the disparity that we see now, 322 doctoral-granting schools to 35 non-doctoral granting schools, is only going to increase.

We believe that one of the strongest reasons for this discrepancy is the amount of time required for prospective authors to pursue their research and prepare their manuscript. The Editors were questioned about the number of months authors should dedicate to their work before submitting their work for review. More than 53% of the respondents said that prospective authors should dedicate 12 months or more to their research before submission

(see Figure 3.) Most non-doctoral granting engineering institutions emphasize engineering education over research. Therefore, it is rather difficult for the faculty members of non-doctoral institutions to find the prerequisite time to compete with authors from corporations, government organizations, and doctoral-granting institutions for the limited amount of papers accepted by the IEEE.
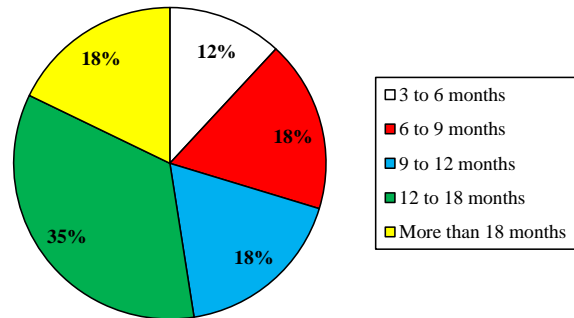

Figure 3. Editors' expected amount of time dedicated by authors prior to journal submission.

4. CONCLUSIONS

Editors of 97 IEEE journals were surveyed. 93% of respondents indicated that 10% or less of their submissions were from non-academic institutions. To correlate this data, we examined a sample of over 2,000 IEEE journal articles. 357 of the articles were authored by individuals from academic institutions in the United States. Of the 357, 35 were authored by individuals from non-doctoral granting institutions (1.7%), with only 8 (0.38%) from institutions where a bachelor degree is the highest degree offered. Based upon these data points, it is our conclusion that the authorship of first-tier, peer-reviewed journals should not be heavily emphasized in the tenure and promotion process at non-doctoral granting engineering institutions.

5. REFERENCES

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[5]   "About Us - Online Survey Software Company - Zoomerang." Online Survey Software Tool - Create Free Online Surveys - Zoomerang. MarketTools, Inc., 2011. Web. 06 June 2011. <zoomerang.com/About/>.

[6]   "IEEE Xplore Digital Library." IEEE, 2011. Web. 6 June 2011. <ieeexplore.ieee.org/Xplore/dynhome.jsp>.

Appendix 1. Survey for IEEE Transaction, Journals, and Letters Editors.

Thank you for taking the time to participate in this survey. I have designed it with you, the Editors in Chief of IEEE Publications in mind. I hope that your answers will grant me insight into your submission and review processes, as well as to your expectations when reviewing a submission. Please take a few minutes to answer these 10 questions as accurately as possible.

Instructions
Please complete the following survey

1)   Please check the option that best describes your regular employer.
_____a non-educational institution such as a corporation or government laboratory
_____a doctoral granting institution
_____a non-doctoral granting institution

2)   How long have you served as an IEEE journal editor? Please check the most appropriate option.
_____Less than 6 months
_____6 to 12 months
_____12 to 24 months
_____More than 24 months
_____I am not currently an IEEE journal editor

3)   Throughout the course of the research, writing, and submission process, how many months do you expect a typical submission's author(s) to invest on the project? P lease check the most appropriate option.
_____Less than 3 months
_____3 to 6 months
_____6 to 9 months
_____9 to 12 months
_____12 to 18 months
_____More than 18 months

4)   What is the typical amount of time elapsed between the submission of an article and its outright acceptance? Please check the most appropriate option.
_____Less than 3 months
_____3 to 6 months
_____6 to 9 months
_____9 to 12 months
_____12 to 18 months
_____More than 18 months

5)   Throughout the submission process, typically, how often do you return an article to its author for revision before you accept it outright? Please check the most appropriate option.
_____0
_____1
_____2
_____3 to 4
_____More than 4

6)   In 2008, approximately what percentage of submitted articles was written by staff at non-educational institutions (corporations or government laboratories)? Please select the most accurate percentage.
          10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

7)   In 2008, approximately what percentage of submitted articles was written by faculty at doctoral granting institutions? Please select the most accurate percentage.
          10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

8)   In 2008, approximately what percentage of submitted articles was written by faculty at non-doctoral granting institutions? Please select the most accurate percentage.
          10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

9)   Which do you perceive to be increasing in numbers of submissions over the next three years? Check all that apply.
_____Non-educational (corporations or government laboratories/institutions)
_____Doctoral granting institutions
_____Non-doctoral granting institutions

10)   Which do you perceive to be decreasing in numbers of submissions over the next three years? Check all that apply.
_____Non-educational (corporations or government laboratories/institutions)
_____Doctoral granting institutions
_____Non-doctoral granting institutions

Thank you for taking the time to complete this survey. Your answers will be a great contribution to our research.

Appendix 2. Example of IEEE Journal Table of Contents with Author Affiliations (1 of 97).

IEEE Transactions on Very Large Scale Integration (VLSI) Systems Vol. 17, No. 1, Published 12 times/year	No ID	Domestic or International Corporation	Domestic School	International School	Total Articles
	0	5	5	5	15
Wire Topology Optimization for Low Power CMOS Zuber, P. Bahlous, O. Ilnseher, T. Ritter, M. Stechele, W. Technol. Aware Design, Interuniversity Microelectron. Center, Lowen;		1			
Low-Power, High-Speed Transceivers for Network-on-Chip Communication Schinkel, D. Mensink, E. Klumperink, E. van Tuijl, E. Nauta, B. Axiom-IC B.V, Enschede;		1			
Maximizing the Lifetime of Embedded Systems Powered by Fuel Cell-Battery Hybrids Jianli Zhuo Chakrabarti, C. Kyungsoo Lee Naehyuck Chang Vrudhula, S. Synopsis Inc., Mountain View, CA;		1			
Ultra Low-Power Clocking Scheme Using Energy Recovery and Clock Gating Mahmoodi, H. Tirumalashetty, V. Cooke, M. Roy, K. Dept. of Electr. & Comput. Eng., San Francisco State Univ., San Francisco, CA;			1		
Random Test Generation With Input Cube Avoidance Pomeranz, I. Reddy, S.M. Sch. of Electr. & Comput. Eng., Purdue Univ., West Lafayette, IN;			1		
Probabilistic Error Modeling for Nano-Domain Logic Circuits Rejimon, T. Lingasubramanian, K. Bhanja, S. Dept. of Electr. Eng., Univ. of South Florida, Tampa, FL;			1		
High Performance, Energy Efficiency, and Scalability With GALS Chip Multiprocessors Zhiyi Yu Baas, B.M. Dept. of Microelectron., Fudan Univ., Shanghai;				1	
Fast Configurable-Cache Tuning With a Unified Second-Level Cache Gordon-Ross, A. Vahid, F. Dutt, N.D. Dept. of Electr. & Comput. Eng., Univ. of Florida, Gainesville, FL;			1		
From Parallelism Levels to a Multi-ASIP Architecture for Turbo Decoding Muller, O. Baghdadi, A. Jezequel, M. Electron. Dept., TELECOM Bre- tagne, Brest;		1			
Hierarchical Segmentation for Hardware Function Evaluation Dong-U Lee Cheung, R.C.C. Luk, W. Villasenor, J.D. Mojix, Inc., Los Angeles, CA;		1			
Design and Synthesis of Pareto Buffers Offering Large Range Runtime Energy/Delay Tradeoffs Via Combined Buffer Size and Supply Voltage Tuning Hua Wang Miranda, M. Dehaene, W. Catthoor, F. IMEC, Katholieke Univ. Leuven, Leuven;				1	
Modeling, Analysis, and Application of Leakage Induced Damping Effect for Power Supply Integrity Jie Gu Keane, J. Kim, C.H. Res. Center for Adv. Sci. & Technol., Univ. of Tokyo, Tokyo;				1	
Performance-Oriented Parameter Dimension Reduction of VLSI Circuits Zhuo Feng Peng Li Dept. of Electr. & Comput. Eng., Texas A&M Univ., College Station, TX;			1		
Interconnect Exploration for Energy Versus Performance Tradeoffs for Coarse Grained Reconfigurable Architectures Lambrechts, A. Raghavan, P. Jayapala, M. Bingfeng Mei Catthoor, F. Verkest, D. IMEC vzw & Katholieke Univ. Leuven, Leuven;				1	
Decoding the Golden Code: A VLSI Design Cerato, B. Masera, G. Viterbo, E. Univ. della Calabria, Calabria;				1	