

I-INCE young professionals program offers grants, advice and opportunity

Rajendra Singha, *The Donald D. Glower Chair in Engineering and Professor, The Ohio State University, Columbus, OH 43210 USA, singh.3@osu.edu, Vice President Technical Activities, I-INCE*

Abstract

The goal of the I-INCE's young professionals program is to first enable young noise control engineers and students to attend the Inter-Noise congresses. Over the past three years, 42 travel grants have been awarded. Second, grant participants and other students are then invited to the Young Professionals workshop, held during the annual Inter-Noise congress. All attendees are given the opportunity to learn valuable skills from experts in the field of noise control engineering. Both workshop and travel grant programs facilitate exposure to senior professionals, experience in formulating research problems, public presentation and paper writing, and development of networking abilities.

1. Goals of the young professionals grant program and workshop

Grant programs for students and young professionals are often needed to attract young professionals to join professional organizations as well as enable them to attend technical conferences, which they may not otherwise be able to do. Accordingly, I-INCE initiated a grant program in 2010 for noise control engineering students and professionals within the first ten years of their careers. The I-INCE Board of Directors authorized granting €500 per recipient toward conference registration and travel expenses.

Applicants must register for the Inter-Noise congress, meet deadlines for submitting abstracts and manuscripts, and actively participate in the congress. Attendance at these conferences promotes their names and their work, allows them to network with senior professionals and helps them develop contacts for future work. They can also advance their skills in writing papers, assembling presentations, and in developing professional relationships.

I-INCE has funded 12 to 18 travel grants per year since 2010, or 42 grants totaling €22,000. Grant recipients join other students at the Young Professionals workshop where experts in noise control engineering share their insights and experience. Grant recipients also receive certificates to commemorate their accomplishment. Young Professionals

Workshop sessions feature presentations on a variety of topics, including career development tactics such as mentoring. These are skills that young professionals and students need to cultivate in order to be successful in their chosen fields.

The June 2012 edition of *Noise/News International* covered the Young Professionals program and its workshops. I-INCE expects to soon announce the 2013 grants, the workshop program and a list of previous winners.

2. Travel grant program

The Inter-Noise congress website carries a call for papers for the grant about nine months before the conference. A link established in 2012 to the main menu of the I-INCE website enables students and young professionals to apply by submitting information including the following: name, affiliation, name of supervisor, local acoustical society, an abstract of the paper and two pages of supporting information, a one-page biography, and personal recommendations from supervisors or local acoustical society members.

The I-INCE Young Professional Grant Committee reviews the applications, typically in two rounds of judging: sorting acceptable and unacceptable papers and grading those that have been accepted. Applicants with the highest grades receive a provisional listing for grant awards, which the technical chair and staff of the Inter-Noise congress distribute, drawing names from a waiting list if top-ranked applicants are unable to attend.

The grant program has drawn students and young professionals from 28 countries as described in [Table 1].

3. Young professionals workshop

The Young Professionals workshop aims to examine noise control engineering case studies and professional issues presented by world-renowned experts and informal discussions between young professionals and I-INCE leaders and senior noise control engineers. Once the winners of the Young Professional Grant have been determined, all of the participants are invited to this workshop to gain

Table 1 – Demographics of young professionals grant from 2010 to 2012.

Country	Country of Origin	Country of Work/ Study
Albania	1	0
Argentina	1	1
Australia	0	1
Austria	0	1
Belgium	1	1
Brazil	2	2
Chile	1	0
China	6	1
Denmark	0	1
France	2	1
Germany	5	3
India	2	0
Iran	1	0
Italy	2	3
Japan	1	3
Korea	3	2
Malaysia	0	1
Netherlands	3	1
Poland	1	1
Russia	1	1
Spain	3	3
Sweden	1	4
Switzerland	1	0
Turkey	2	2
United Kingdom	0	6
USA	2	7
Vietnam	2	0
Zimbabwe	1	0

valuable contacts and view presentations by noise control professionals. The invitation is also extended to any student who is formally registered for the conference. A notice about the workshop is usually posted on the Inter-Noise website giving those who are not directly invited a chance to contact the workshop hosts in order to attend the workshop.

The first workshop in Lisbon, Portugal, in 2010 attracted 29 participants, while the second workshop in Osaka, Japan, in 2011 attracted 27 participants. The most recent workshop held at Inter-Noise 2012 in New York had 57 participants, which included graduate students, post-doctoral researchers and young noise control professionals. The topics in 2010 included *Reducing Road Noise with Quieter Pavement*, *Industrial Noise Control*, and *Control of Structure-borne Sound in Wood Frame Floors*. At Inter-Noise 2011 and Inter-Noise 2012, the topics of discussion included issues related to mentoring, such as *How to Formulate Research Problems*,

How to Publish, and *How to Network*. These are discussed further.

4. Summary of mentoring presentations

4.1 How to formulate research problems? (By Dr. Rajendra Singh) [1]

According to *Cambridge Dictionaries Online*, research is defined as a detailed study of a subject, especially in order to discover new information or reach a new understanding. The presentation given at the Young Professionals Workshop at Inter-Noise 2012 suggests that “true innovation requires a collaborative partnership between academia, government and industry.” In the United States, many government funding agencies require collaboration with industry to ensure relevance. Unfortunately, some in industry tend to view academic research as mostly “non-practical.”

The nature of industry is to design, manufacture, sell, and service products and systems. After all, it is a business. Real problems must be seen before they are investigated, and the solution is more important than an understanding. Real system and lab experiments are used to find and fix problems, and computational methods rely on the extensive use of commercial software. On the other hand, the nature of academia is education at Bachelor’s, Master’s, and PhD levels, and research is an integral part of education. Most research problems generally come from prior publications. A gulf exists between academic research and real-world needs. Research methods in academia include analytical solutions with strong emphasis on closed form solutions or semi-analytical methods; experiments are generally used to verify theory or new/improved models and/or hypotheses. Computational methods are often employed to supplement analytical techniques or laboratory methods.

Academic research comprises a number of aspects. For faculty, the education and mentoring of students is key, along with enhancing critical thinking skills, teaching research methods, and preparing them for future jobs. Students, meanwhile, must learn how to conduct independent inquiries, communicate through theses, papers, and presentations, complete all academic requirements in order to earn a degree, and hopefully find more satisfying jobs. Industry and government value academic research that is associated with well defined objectives, deliverables related closely to a product or process mission, and results related to minimizing cost, improving utility, and optimizing system efficiency or capacity. The goals of sponsored research usually include fundamental investigation of real-life problems, improved models of physical

systems, new calculation methods, and dynamic or acoustic design of components or systems. Ideally, research is a blend of all three perspectives.

Common academic research projects 1, run many experiments, compile data, and draw conclusions; 2, refine or extend existing theory, computational models and experiments; 3, validate software models by using analytical and experimental methods; 4, expose and rectify unreasonable assumptions, improper methods, or mistakes in prior papers; 5, attempt to explain empirical observations by developing new or refined experiments or models; 6, gain new physical insights by conducting comprehensive analytical and experimental studies; and 7, anticipate emerging issues and conduct studies.

Global trends raise questions about how best to define long-term research problems, particularly for noise control, given a rapidly changing world and the product features that help to define it? For instance, durations are shortening for R&D projects, including practical noise and vibration problem-solving. Digital models and virtual-reality simulations are in demand, as are energy-efficient and compact devices, environmentally friendly equipment, faster operations, cost reduction (without adequate engineering), easier assembly, and fast, lean manufacturing with lower costs.

Friction-induced vibration and noise associated with vehicle brakes offer an instructive example. The three well known problems are judder, groan, and squeal. For high-speed brake judder at low frequencies, for example less than 100 Hz, instability is not an issue. Judder is proportional to the wheel speed and perception occurs at the steering wheel or brake pedal with vibration. With brake groan, for example from 100 to 500 Hz, the physical process is a low-speed braking event, and different stick-slip modes are the instability issue; it is perceived by sound. Brake squeal is a high-frequency range issue, for example from 1 to 16 kHz, and it is primarily perceived as radiated sound. It is a random process where several instability mechanisms are observed. Literature on these subjects is increasing with interest in brake vibration and noise, with most publications, primarily conference papers, coming in the last 20 years. Squeal, however, inspires the most publications, more than 700, followed by judder, about 50, and groan less than 50. Many papers seem to address linear system dynamics based on large-scale numerical codes, but fundamental knowledge is still elusive.

In conclusion, better understanding of machinery noise sources and paths is needed, especially the role of non-linear sources such as gaps, dry friction, and time or spatial parameters. New or improved multi-disciplinary models are needed. Novel ways to control noise, shock, and vibration projects

would be needed. The science must however focus on the sources.

4.2 How to publish (by Dr. Courtney Burroughs) [2]

Dr. Courtney Burroughs, editor of *Noise Control Engineering Journal*, presented guidelines for publishing, including the differences between publishing at conferences and in journals. He stated the rationale for publishing and outlined the ethics of publishing.

Some conferences, including Inter-Noise, Noise-Con and Euro-Noise, require the submission of written papers, which are checked for content and published without review. Other conferences, including ASME and SAE, that require submission of written papers publish them only after they are reviewed. For still other conferences, including ASA-POMA, the submission of written papers is optional, but the abstract is published. Journal publications are always reviewed.

The case for publishing is compelling. Publishing can be a research tool. It helps to organize one's thoughts and data, find gaps, and open new lines of reasoning. Publishing disseminates useful information and advance the state of understanding. It fulfills requirements set by funders of research. Publishing can establish the author's credibility in a specific research area and earn recognition for the effort.

The ingredients of a successful submission are new material, information that is important to an area of research, good writing, high-quality figures that support arguments, a subject of interest to readers and conference participants, and a concise, compelling abstract. The original submission should represent the author's best effort, worthy of a final version, rather than a draft awaiting editing by reviewers.

Some things should never be attempted. Never submit the same paper to multiple journals simultaneously. This is a disservice to the professional community and damages the author's reputation. Never plagiarize, either by stealing another's work or repeating your own. Never send un-refereed conference papers for review by a journal outside the conference organization without revising the paper by adding at least 50 percent new material. Submission of INCE conference papers to NCEJ is encouraged, provided that the paper is carefully reviewed and revised with additional material or analyses to improve its reception.

The main elements of a paper are: introduction, approach, results, conclusions, and references.

The introduction should state the problem and explain what the paper is addressing that has not been previously addressed. The introduction should

critically review previous efforts and review relevant literature. Self-references should be warranted, not gratuitous. The approach should be clear, complete, and concise. Readers should have enough information to duplicate the work. References to easy-to-find literature help to avoid needless repetition. Details that break the paper's flow, such as detailed mathematics, should be placed in the appendix. Figures should be clear and easy to read. Type fonts should be consistent and appealing in the published document. Captions should be concise, complete sentences that complement, not repeat, material found in the main text. Data being compared should be scaled alike and displayed close together. Explanations and analyses should relate to the research objectives and should be composed as though readers are only generally familiar with the material. Data that does not support the research hypothesis should be acknowledged, not ignored.

The summary should concisely bring key findings into focus and relate research results to objectives. Conclusions should rest on results and suggest future research.

Reviewers control the review step of publication. Authors control the revision process. Publication is, of course, controlled by the publisher. Each step takes approximately two months. The editor facilitates and monitors the process, chooses reviewers, and decides publication based on reviews and responses. A paper usually requires two to three reviews, which reviewers perform without compensation in their free time. The editor must balance the author's interest in prompt publication and the reviewers' duties elsewhere. Reviewers typically have two months to submit their comments. If reviews are mixed or tardy, the editor may request additional review, reject the paper with instructions to not resubmit or welcome resubmission after significant revision. The editor can issue a provisional acceptance pending minor editing or format revision. Occasionally, a paper is accepted without revision.

Authors have sole discretion to revise their work but if they agree to make revisions should do so promptly; many journals impose strict time limits on revisions. Revisions should cover all comments raised by all reviewers; it is usually better to do so than to argue with the editor, whose say is final.

Authors who choose to submit a rejected paper to another journal should expect that certain reviewers may see it for the second time.

Authors should be aware that the reviewer is not the enemy but a source of helpful recommendations that may well anticipate questions and comments from readers. Revisions almost always improve a paper, for which the author receives credit.

Authors should compile for the editor a list of edits as they correspond to the reviewers' comments

for easy tracking and verification. An author should refrain from making unprompted changes to a paper without informing the editor; making major unrequested changes could necessitate a new round of review. Rigid compliance with the reviewers' comments is not always required, but disputes should be avoided. Animosity toward the reviewers is counterproductive; cooperation and tact are almost always rewarded.

4.3 How to network (by Dr. Stephen Hambric) [4]

Dr. Hambric provided personal perspective and related his accomplishments to hard work and networking.

A network is a group of people who help each other by sharing information useful in securing opportunities for jobs, projects, and professional advancement. Most people think of networking as communicating through Internet sites *Linked In* or *Facebook*. Professional networking is most effective face to face, and professional meetings are an ideal venue. Anyone can be a prospect, including people outside your area of expertise. Networking contacts can be young or old, experienced or inexperienced, academics and professionals, and salespeople. Professional meetings provide abundant opportunities to establish contacts and advance business relationships: evening socials, coffee breaks, vendor expositions, poster sessions, meals, etc.

Young professionals are wise to join informal discussions that audience members typically conduct with featured speakers after conference sessions and presentations. They are usually rewarded with new contacts or simply new understanding when they ask other people about their interests, job, career, company, education, country or hometown. Exchanging professional contact information is fundamental to the process. Referring a third party – a potential customer, for example – to a new contact can create a lasting, favorable impression.

Young professionals also do well to resist the temptation to continuously drive conversations toward themselves and instead practice the art of listening and learning. Brief, polite, and pleasant are traits that play well. Good listeners come to recognize the moment when a networking conversation begins to wind down and with a few words of appreciation and thanks bring it to a smooth, pleasant conclusion that allows for good use of limited time and opens the way to the next opportunity.

Just as verbosity can repel networking contacts, shyness can block conversations from ever beginning, especially when young professionals consider approaching senior or ranking professionals. Shyness can be overcome with time and practice. One method is to attempt to politely join interesting

conversations, perhaps by asking a pertinent question that helps keep an established conversation moving along. Introverts can become effective at networking through patience, polite persistence and a measure of optimistic determination.

Networking fundamentals include follow-up communication within a week or two after a meeting with a promising contact, typically a phone call or email with a personal greeting. Other things to remember: help your new contact in some way, perhaps by forwarding or noticing relevant papers, news items, or information sources. Renew contacts when opportunities arise. Follow-up whenever new information that comes your way might be useful to a good contact or when you learn of a career opportunity or a teaming arrangement well suited to one of your contacts. Other such opportunities might include theses defense and even social events that match shared personal interests. Regarding conferences, arrive early, stay late, and always bring business cards.

Dr. Hambric encouraged young professionals to remember that mutual aid is the defining characteristic of a professional network: help your network, and it will help you. He recommends the book *Rainmaking* by Ford Harding [5].

5. Conclusion

I-INCE has created a grant program to help students and beginning noise control engineers attend Inter-Noise congresses and meet senior professionals. The Young Professionals Workshop is an opportunity to network with senior engineers and learn valuable lessons in research formulation, publishing, and networking. The grant competition is international and has attracted participants from 28

countries. The Young Professionals Workshop at Inter-Noise 2012 was the most successful yet with 57 participants, nearly doubling the previous years' attendance. I-INCE hopes to foster further growth of the program to help today's students and young professionals become tomorrow's senior engineers and leaders of our profession.

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