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Awards and Citations

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During my tenure as editor for *Optical Engineering*, my main priority has been to increase the quality of papers published in the journal. Given the technological diversity of the published papers along with the intangibility of what constitutes a high-quality paper, it has been difficult to assess progress towards this goal. Our most recent Journal Impact Factor of 1.209 represents an all-time high for *Optical Engineering*, which does give some indication of progress, but we all understand that the value of scientific publication extends well beyond citations.

A topic of recent discussion among the *Optical Engineering* editorial board has been if and how to recognize our best papers and whether such recognition could serve as a catalyst for increasing overall journal quality. Opinions on the topic are quite varied, as you might anticipate. While most are in favor of such recognition, the complexities of objectively assessing paper quality amongst more than 650 annual journal publications represent a major challenge. Without a thorough and objective selection process, the concept of best papers is not meaningful.

The event that initiated this discussion was a significant change to the SPIE Rudolf Kingslake Medal and Prize. Until this year, the Kingslake Medal served to recognize the most noteworthy paper published in *Optical Engineering* on theoretical and experimental aspects of optical engineering. The awardee was identified by a special committee through a systematic evaluation and assessment that considered every paper published in the journal the prior year.

The broad scientific scope of *Optical Engineering* has represented a challenge for the Kingslake selection committee. Furthermore, as an SPIE award, the exclusion of papers from other SPIE journals was considered inappropriate. Based on these and other factors, the SPIE Board of Directors resolved to change the nature and scope of the award. Beginning this year, the Rudolf and Hilda Kingslake Award in Optical Design will recognize a significant achievement in the field of optical design. It will no longer recognize a paper published in the journal but will be presented to an individual who has made significant contributions to the field of optical design as a whole based on an open nomination process.

I am hopeful that contributors to *Optical Engineering* will compete for recognition by this new Kingslake award. Without an explicit *Optical Engineering* best paper, however, the editorial board encouraged me to give some attention to alternative means to recognize our highest quality papers without instituting a cumbersome selection process.

This year, it is easy to recognize one top-quality paper: the 2018 Kingslake Medal winner that was recently announced. This award went to Bobby Hunt, Amber Iler, Christopher Bailey, and Michael Rucci for their paper[1] titled "Synthesis of atmospheric turbulence point spread function by sparse and redundant representations." It details a computationally efficient alternative to traditional wavefront propagation methods to simulate long-path turbulence effects on imaging systems. The approach is based on a singular value decomposition algorithm that establishes a sparse representational dictionary of collected point spread functions to serve as a basis for simulation. I was particularly pleased with this selection because not only is the work very relevant to my research interests but I also happen to be on the doctoral committee for one of the coauthors. It gives me great confidence that he will excel—as he has already.

Of course, there are many other excellent *Optical Engineering* papers that can be placed beside the Kingslake Medal winner. While citations are but one measure of quality and impact, it is a simple indicator. In the remainder of this editorial, therefore, I will highlight a few of our top-cited papers over the past three years.

As I reviewed citation statistics, it was not surprising that review papers occupied the top spots on the list. The overall top-cited paper[2] was "Review of nonlinear ultrasonic guided wave nondestructive evaluation: theory, numeric, and experiments" by Vamshi Chillara and Cliff Lissender. This paper was published as part of the Special Section on Structural Health Monitoring: Use of Guided Waves and/or Nonlinear Acoustic Techniques, and covers emerging developments using nonlinear spectroscopy, second-harmonic generation, and other guided wave mixing techniques that provide sensitivity for detecting and characterizing microscale defects in materials. You may be wondering how this work fits within the scope of *Optical Engineering*; while the nonlinear guided wave theory looks somewhat familiar, this is ultrasonics, not optics! I included this special section as an accommodation for the scientific community who participate in the SPIE Symposium on Smart Structures and Non-Destructive Evaluation and lack a home among SPIE journals for publication. While there is perhaps a legitimate argument that I may have overextended the journal scope in this case, I am pleased with its positive impact.

As noted in past year-in-review editorials, some of the *Optical Engineering* papers with highest impact reside in special sections. They also occupy the highest spots on the top-citation list after review papers. The top-cited special section paper[3] was "Tungsten diselenide Q-switched erbium-doped fiber laser" by Bohua Chen, Xiaoyan Zhang, Chaoshi Guo, Kan Wu, Jianping Chen, and Jun Wang. This paper presents the design and fabrication of a thin polyvinyl alcohol film containing dispersed tungsten diselenide crystals that exhibits saturable absorber properties. Inserting this film into a laser cavity with a diode-pumped, erbium-doped fiber, the authors were able to produce stable 27 kilohertz pulsed operation at 1560 nanometer wavelength.

Relative to review and special section papers, differences in citations among the top regular issue papers are somewhat smaller, so small that recognizing a single top-cited paper might be inaccurate. By the time this editorial is published,

a contender might receive a few more citations and change the ranking. So I will briefly mention the top three at this time, which fall in the following areas: (1) precise indoor 3-D positioning combining modulated light-emitting diodes, artificial neural networks, and genetic algorithms,[4] (2) polymer-based, phonic crystal fibers for low-loss, polarization-preserving transmission of terahertz radiation,[5] and (3) an imaging spectrometer design achieving area coverage commensurate with LandSat but with 10 nanometer spectral resolution over the 0.4 to 2.5 micron spectral range.[6] Interestingly, each of these top-cited papers strictly addresses design and analysis, not experimentation.

Given the recent Kingslake award changes, we will continue our editorial board discussions on how to best identify and recognize some of our best papers, and I also plan to highlight them annually. So please send that great paper you are writing to *Optical Engineering* to give us another excellent candidate to recognize as one of our top-quality publications.

Michael T. Eismann
Editor-in-Chief

References

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