

A Report on the IEEE Life Sciences Grand Challenges Conference

On October 4–5, 2012 I had the good fortune to attend the first IEEE Life Sciences Grand Challenges Conference (IEEE LSGCC) held at the National Academy of Sciences in Washington, D.C. The two day meeting had attendees from essentially all IEEE societies, reviewing applications and advancements of engineering in biomedicine. IEEE Life Sciences represents a new direction for IEEE, focused on the ever increasing need for improved engineering solutions for high quality, lower cost solutions to healthcare. As biology generates larger datasets, the need for computational intelligence approaches also increases. As a biologist, it was excellent to see presentations from both engineers and biologists, with IEEE pulling the two fields closer together.

The meeting itself was largely focused on medical applications, including improved devices, use of robots as medical assistants, even visualization methods for modeling of biological systems such as blood flow in the heart so that new types of replacement valves could be tested in a realistic simulation environment where the researcher can interact with the simulation in three dimensional projections.

IEEE CIS was mentioned in a lecture by Shangkai Gao (Tsinghua University) regarding the importance of and future directions in brain-computer interfaces. It was good to see the importance of machine learning featured, as



The start of the first IEEE Life Sciences Grand Challenges Conference in Washington, D.C. at the National Academy of Sciences.

well as a cover from a previous special issue on this topic in *IEEE Computational Intelligence Magazine*!

A highlight for me was the lecture by Nobel Prize winner Phillip Sharp on the convergence of the life sciences, physical sciences, and engineering. It is this convergence that was the focus of the meeting, the will allow for knowledge integration and iteration, to provide actionable insights to future clinicians. A common theme in many talks was the need to translate better modeling and engineering throughout the healthcare chain, not just to the clinician but to better

informed and engaged patients. While some presentations highlighted promising advances already being made in these directions, the advent of big data in biology and the realization of the scope and size of the problems in systems biology remain daunting. These “grand challenges” will be the reason why this new direction for IEEE will pay dividends for researchers and patients for years to come.

For more information on the IEEE Life Sciences Initiative, please visit <http://lifesciences.ieee.org>.