

UW CSE alum Yaw Anokwa honored with 2015 Diamond Award for Distinguished Service



Yaw Anokwa (Ph.D. '12) is an entrepreneur whose small company is having a massive impact by offering a powerful and transformative service within the global health community. In his mission to help those who provide health care to the underserved in some of the poorest regions on earth, he has traveled to more than 30 countries and worked with prominent clients such as the Bill & Melinda Gates Foundation and local affiliates of the World Health Organization.

Anokwa was one of the researchers who helped build the Open Data Kit (ODK) into a widely used data collection tool and the core technology of his company, Nafundi. For his commitment to applying technical expertise to global problems, Anokwa has been honored by the National Science Foundation, Ford Foundation, and Tides Foundation — and now by his alma mater through UW College of Engineering's Diamond Award for Distinguished Service.

"It's an honor to receive this award," Anokwa says. "I had a great experience at CSE, with the freedom to pursue my research goals with faculty and students who shared the same concerns and commitment, including Carl Hartung, my friend and co-founder."

Born in Ghana, Anokwa moved to the U.S. at the age of 10 when his father, a journalism professor, joined the faculty at Butler University. Anokwa earned simultaneous degrees in computer science at Butler University and electrical engineering at the Indiana University-Purdue University campus, both in Indianapolis. A brief stint with a big tech firm led to

the realization that the corporate sector was not his ideal career realm, so he headed to Seattle and UW CSE's graduate program. Among all the schools he considered, he felt most warmly welcomed here, especially by his future advisor, Professor Gaetano Borriello.

Anokwa's research at CSE explored applications for near-field communication (NFC) enabled phones. After completing his master's degree, he interrupted his studies to travel to rural Rwanda for six months to explore ways in which he could apply his technical expertise to global health problems such as HIV and tuberculosis. As a volunteer with Partners in Health, he followed health care workers and saw how paper-based record keeping trapped data and hindered efficient delivery of care. He also observed that smart phones and the Internet were available even in poor areas that lacked clean water and reliable electric power — giving him an idea for how to address the data clogs.

Returning to CSE to complete his Ph.D., Anokwa and his colleagues advanced the development of ODK, a free and open-source set of cloud-based tools that originated in Google's Seattle Office in 2008 as a sabbatical project directed by Borriello. ODK helps organizations create and manage solutions for mobile data collection that includes GPS locations and images. Simply put, it's a smart replacement for the ubiquitous paper form. Most of the tools are based on smart phones and tablets that use the Android operating system, and users can easily import and export data using common formats and interfaces.

Since their early years in the Ph.D. program, Anokwa and Carl Hartung (Ph.D. '12) had talked about forming their own company to make data collection products available to underserved communities in remote or poor areas around the world. In 2011 they founded Nafundi to fulfill their mission to deliver large-scale data collection and management services to major organizations in the global development sector. The company name is derived from the Swahili word *fundi*, meaning craftsman.

"We see ourselves as fundis," Anokwa says.

"Gaetano joked that Carl and I don't take direction well and don't work well in standard environments, so founding our own company allowed us the freedom to do things our way," Anokwa says. "Gaetano was driven

by the interests of his students, and he absolutely put them first. His passing is a huge loss to me, to the CSE program and the computer science field."

Rather than chasing Silicon Valley investment, the partners bootstrapped the company and set a goal to remain small, nimble, and in charge while taking on big, challenging projects that are a good fit for their expertise. They often hire UW CSE students as contractors, and they aim to maintain a healthy balance between work and quality of life with their families and friends. Hartung is based in the Seattle office while Anokwa is more nomadic, traveling the globe to oversee project launches in Africa, Central America, Southeast Asia and the Middle East.

"The most meaningful experience for me so far is a recent polio eradication project in partnership with the Gates Foundation in challenging environments in the Middle East. In areas where the Taliban routinely murders vaccinators, brave health care workers are using ODK to document vaccination coverage. With ODK, supervisors can see and react to the time-sensitive data in hours instead of weeks."

"It's rewarding to know they can efficiently identify areas needing vaccination coverage, and we can now show with accurate real-time data that we are close to eradicating polio," he says.

To his delight, Anokwa also discovered that a local unit of the World Health Organization in Jordan had built and deployed its own data system based on ODK — just as its developers had envisioned. For the immediate future, Anokwa hopes Nafundi can help find a way to support Borriello's goal for continuing research and development on ODK at CSE and in the community.

To learn more, visit: <http://nafundi.com>.



2015 Diamond Award honorees Alan Miller (Ph.D. '77 Materials Science & Engineering), Milt Zeuschel (B.S. '60 Electrical Engineering), Christophe Bisciglia (B.S. '03 CSE) and Yaw Anokwa (Ph.D. '12 CSE)

UW CSE's James Lee wins Best Paper Award at ACM Symposium on Theory of Computing 2015

UW CSE professor James Lee captured the Best Paper Award at the 2015 ACM Symposium on Theory of Computing (STOC) with co-authors Prasad Raghavendra — a UW CSE Ph.D. alum now at UC Berkeley — and David Steurer of Cornell. The winning paper, "Lower Bounds on the Size of Semidefinite



Programming Relaxations," is the result of breakthrough research showing that one of the most powerful techniques currently available for designing polynomial-time algorithms does not work for fundamental NP-complete problems, including the Traveling Salesman Problem, the Maximum Independent Set Problem, and a number of other combinatorial problems.

Lee and his colleagues studied the efficacy of convex programming relaxations, specifically those expressed as semidefinite programs (SDPs). SDPs can be seen as combining the rich expressiveness of linear programs with the global geometric power of spectral methods. For many problems, SDP-based algorithms are widely viewed as the strongest tool in the algorithm designer's arsenal. The team's result is a rare example where computer scientists can show formally that a powerful computational model cannot efficiently solve NP-complete problems.

The paper draws on techniques and intuitions from many areas, including proof complexity, machine learning and quantum information theory. It is the latest example of Lee's research exploring the rich interplay between computation and geometry, probability and physics.

To learn more, visit: homes.cs.washington.edu/~jrl/.