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For Immediate Release

ACM and CSTA Announce 2018–19 Cutler-Bell Student Winners
Four Students Recognized for Engagement in Computer Science

NEW YORK, March 4, 2019 — The Association for Computing Machinery (ACM) and the Computer Science Teachers Association (CSTA) announced four high school students were selected from among a pool of graduating high school seniors throughout the U.S. for the Cutler-Bell Prize. Eligible students applied for the award by submitting a project/artifact that engages modern technology and computer science. A panel of judges selected the recipients based on the ingenuity, complexity, relevancy, and originality of their projects.

The Cutler-Bell Prize promotes the field of computer science and empowers students to pursue computing challenges beyond the traditional classroom environment. In 2015, David Cutler and Gordon Bell established the award. Cutler is a software engineer, designer, and developer of several operating systems at Digital Equipment Corporation. Bell, an electrical engineer, is researcher emeritus at Microsoft Research.

Each Cutler-Bell Prize winner receives a $10,000 cash prize. The prize amount is sent to the financial aid office of the institution the student will be attending next year and is then put toward

each student's tuition or disbursed. This year's Cutler-Bell Prize recipients will be formally recognized at the Computer Science Teachers Association's 2019 Annual Conference, July 7–10, in Phoenix.

The winning projects illustrate the diverse applications being developed by the next generation of computer scientists.

Naveen Durvasula, Montgomery Blair High School, Silver Spring, Maryland

Naveen Durvasula developed a principled method to predict, for a given patient-donor pair, the expected quality and waiting time of the transplant they would receive through kidney exchange. To accomplish this, Durvasula developed a realistic simulator to model the kidney-exchange process using data extracted from a private database. By simulating a given patient-donor pair in the pool many times and recording the quality and waiting time for the transplant, there can be an approximation of the probability distribution over these quantities. Realizing this method was not scalable, Durvasula created a prediction model to interpolate the output of the simulator. After testing the method, it was found it provides clinically acceptable estimates and outperforms all standard applications from the Sci-Kit learn pipeline.

Isha Puri, Horace Greeley High School, Chappaqua, New York

Isha Puri's project focuses on the development of a system to detect the direction and frequency of gaze fixation to test for and diagnose dyslexia. Realizing that the analysis could be performed on eye movement patterns directly, Puri developed six main steps to the process: take a video of a child reading a standard passage using a webcam, separate the video into frames, isolate right and left eyes from the image, develop a highly accurate eye tracker that uses a webcam, extract fixation frequency and duration features to predict dyslexia and test on real patients. Puri's software automatically extracts the duration and frequency of reader fixations in a webcam stream with a combination of machine learning methods and then builds a data-driven prediction model to predict a high-risk of dyslexia. This implementation provides a highly accurate and freely available eye tracking methodology for diagnosing a variety of medical conditions.

Eshika Saxena, Interlake High School, Bellevue, Washington

Eshika Saxena set out to explore the possibility of designing a portable and affordable microscope attachment for a smartphone that can capture images of blood cells from a peripheral blood smear and develop software that can enhance and analyze these images automatically and screen for disease without manual intervention. Saxena focused on screening for sickle cell disease, which is prominent in resource-constrained regions where an inexpensive screening solution is needed. This resulted in the successful development of the "HemaCam," a hematological disease screening framework that makes complex disease screening as simple as taking a picture. HemaCam is comprised of a clip-on, 3D printed attachment that turns a smartphone camera into a microscope capable of capturing blood cell images. These images

are analyzed by Saxena's deep learning software to identify abnormalities and diagnose diseases instantly. The software learns from examples and is fully trained to recognize sickle disease with 95.63% accuracy. The framework makes in-home hematological disease screening viable and extends healthcare across borders. Saxena is in discussion with the "Sickle Odisha" organization in the sickle belt in India, to organize large scale field testing for HemaCam to accelerate disease screening.

Varun Shenoy, Cupertino High School, Cupertino California

Varun Shenoy's vision is to develop an effective method to diagnose the onset of wound complications during surgical operations using computer science. The design process was split into three phases: conducting a comprehensive literature survey, developing the algorithms and mobile application, and documenting the results of the research. During phase one, Shenoy defined the project statement and worked with Dr. Oliver Aalami to collect mages for the project's dataset. Next, Shenoy developed the computational model and mobile application, concluding that artificial neural networks would be the optimum classifier, and developed an application for a patient to interact with computational models. Shenoy concluded this project by writing a research report documenting the approach and experimental results in a presentation and poster format, showcasing the impact to not only the patient but the doctor, hospital and insurers. This research has the capability to positively impact postsurgical wound care in our society by leveraging the power of computer science.

"We are proud to support an effort which encourages high school computer science students to develop projects that will advance society," said Cutler and Bell. " We hope that, whatever careers these students ultimately pursue, they will consider the ways in which technology can have a positive impact on the wider world. Beyond challenging the students to stretch their skills and imaginations, developing their own projects gives students confidence."

"The Cutler-Bell Prize challenges high school students to not only stretch their imaginations but also to lay out the practical steps for how a computational approach could solve a pressing problem in society or business," said ACM President Cherri M. Pancake. "These are the kinds of skills students will increasingly need in our digital age. In short, the Cutler-Bell Prize encourages students to see the possibilities, as well as the excitement, that computing offers. ACM thanks Gordon Bell and David Cutler for sponsoring the award, as well as the growing number of students and teachers who participate each year."

"The high caliber submissions we received this year are outstanding examples of the new ideas that are generated thanks to the increase in K–12 students learning computer science," said Jake Baskin, Executive Director of CSTA. "Our winners have created projects that have applicable real-world solutions, all resulting from the high-quality computer science education they have received."

About the Association for Computing Machinery (ACM)
ACM (acm.org) is the world's largest educational and scientific computing society, uniting computing educators, researchers and professionals to inspire dialogue, share resources and address the field's challenges. ACM strengthens the computing profession's collective voice through strong leadership, promotion of the highest standards, and recognition of technical excellence. ACM supports the professional growth of its members by providing opportunities for lifelong learning, career development, and professional networking.

About the Computer Science Teachers Association (CSTA)
CSTA's (csteachers.org) mission is to empower, engage and advocate for K-12 computer science teachers worldwide. CSTA is a membership organization which supports and promotes the teaching of computer science and other computing disciplines. The Association for Computing Machinery founded CSTA as part of its commitment to K-12 computer science education.

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