

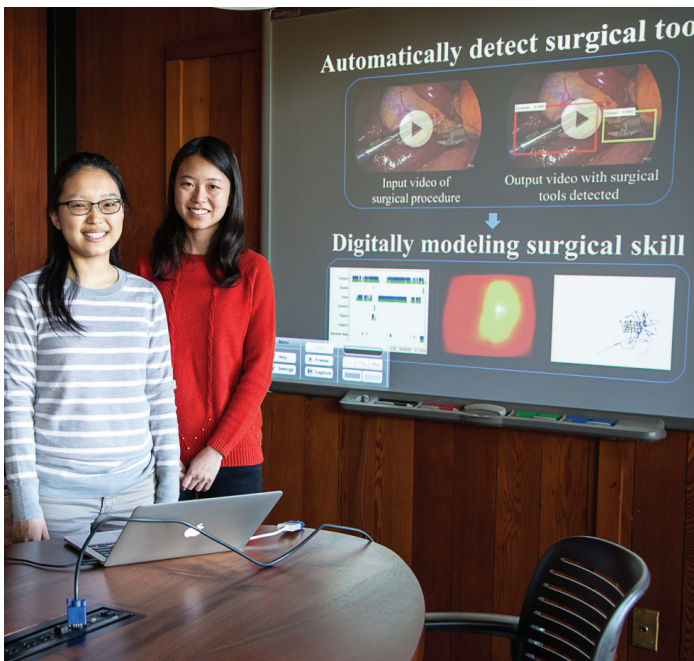


BETTER HEALTH CARE WITH LESS HEALTH SPENDING

The Stanford Clinical Excellence Research Center (CERC) is discovering new care delivery methods to solve our nation's persisting crisis in the affordability of excellent care.

CERC-SAIL HIGH SCHOOL INTERN AND HER MENTOR WIN TOP AWARD AT GLOBAL SCIENTIFIC CONFERENCE

A study led by San Jose high school junior Amy Jin, her Stanford doctoral student mentor Serena Yeung, and CERC surgical researcher Jeff Jopling, MD, won Best Paper Award at the annual international Neural Information Processing Systems Workshop on Machine Learning for Health, held in December. More than 100 research papers competed for the award.



San Jose high school student Amy Jin with Stanford doctoral student Serena Yeung.

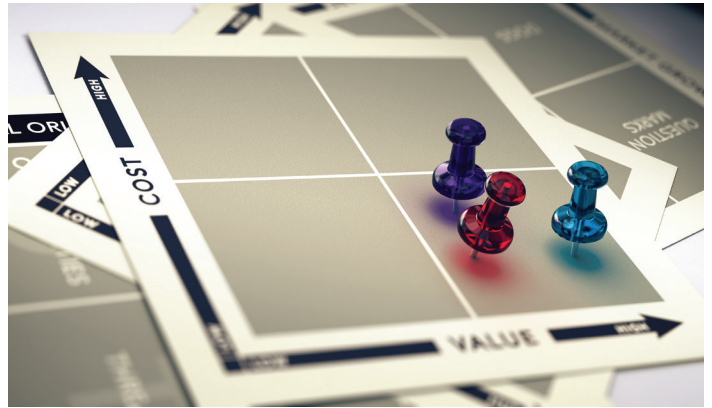
The team used deep-learning methods to detect and track the spatial location of surgical tools in surgical videos, and produce measures of surgical quality based on surgical instrument use patterns, movement range, and economy of motion. Amy is by far the scientific workshop's youngest lead author of a Best Paper Award.

Amy's summer internship at Stanford began in her high school freshman year via the Stanford AI Lab's (SAIL) Outreach Summer Program for girls intrigued by computer science. She and graduate student mentor Serena Yeung conceptualized their novel application of AI with Dr. Jopling. Additional co-authors are Jonathan Krause, PhD; Dan Azagury, MD; Arnold Milstein, MD, MPH; Fei-Fei Li, PhD. The paper adds to prior studies completed via CERC's expanding collaboration with the engineering school's AI Lab, researchers from the medical school's departments of medicine and surgery, and nursing staff from Stanford's adult and children's hospitals. In addition to supporting efforts to assess and improve surgical technique, the studies target real-time detection and prevention of costly errors in bedside care in ICUs, children's hospital units, and the homes of medically fragile seniors.

ROBUST SCIENTIFIC ENDORSEMENT OF UNPRECEDENTED CERC STUDY ON LOW-COST, HIGH-QUALITY PHYSICIAN CARE

An editorial by three nationally eminent health-care scientists accompanied the publication of the first-ever U.S. studies of clinical teams that excel on high-value health care. In their endorsement of CERC's novel research, they comment, *"This study is especially refreshing in its close attention to specific designs and processes in care. For improvement, it sheds light where we most need light. Far too often, debates about how to improve the care of patients cycle endlessly around modifications in incentive structures and payment and treat the details of care as a black box—uninteresting or impenetrable.*

People who give and receive care know better; they know that the details of care matter. They know that, no matter how clever the payment system is, nothing about the experiences and outcomes of care—or "value"—changes until the care changes. And they know that studies like this one, which illuminate the fine structure of care, will in the end do far more to help clinicians and organizations achieve better care at lower cost than will a thousand more treatises on econometrics and incentives."



CERC researchers uncovered scalable attributes of U.S. clinical teams in oncology and in primary care attaining high quality of care with low total health-care spending. The timing of CERC's discoveries coincides with new Medicare physician financial incentives to improve health-care value. Some private insurers are reinforcing Medicare's push via parallel incentive programs. Incentives will rise to plus or minus 9 percent of Medicare payment to physicians by 2022.

CERC found that six attributes distinguished clinical teams providing high-value primary care. The attributes were associated with 34 percent lower annual per patient health-care spending than U.S. physician peers. Distinguishing attributes of high-value oncology care included early discussion of limits and consequences of treatment and rapid response to patient pain and nausea. Pilot tests of the transferability of these high-value care attributes are now underway in multiple states.

CHINESE TECHNOLOGY UNIVERSITY TO SUPPORT CERC-SAIL DEVELOPMENT OF COMPUTER VISION TO PREVENT COSTLY BEDSIDE ERRORS

Shanghai Jiao Tong University (SJTU) will invest \$10 million to equip a hospital in Shanghai to support artificial intelligence (AI) research in computer vision by CERC's Partnership in AI-Assisted Care (PAC) with the Stanford Artificial Intelligence Lab (SAIL). PAC-affiliated faculty and students will use computer vision to close the gap between intended care and actual care. Prior studies in the U.S. indicate that the incidence of bedside errors in care remain high, including failure rates in excess of 40 percent in use of hand sanitizers before entering patients' rooms.

SJTU's affiliated health-care system serves more than one million patients. PAC's productive three-year-old trans-disciplinary research collaboration is led by Professors Fei-Fei Li and Arnie Milstein.

SJTU President Zhongqin Lin flew to the Stanford campus in February to sign an agreement to establish the research capability. The Shanghai hospital will supply video data capturing moment-to-moment care activities in hospitals and in community settings to enable PAC research teams to build computer algorithms that detect bedside clinician errors in real time. Subsequent research will include real-time correction of deviations from clinical pathway steps, and emancipation of busy nurses and doctors from the disheartening task of clinical data entry.

