The Association for Research in Vision and Ophthalmology
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Press Release
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Researchers share latest high-tech advances in vision research

News conference features five studies presented at ARVO 2018

Honolulu, Hawaii –Researchers from around the world are sharing the latest high-tech advances in research to treat, diagnose and prevent diseases causing vision loss. The new findings demonstrate the impact of technology on vision and on vision science. The five studies will be presented in a news conference — virtually and onsite — at the 2018 Annual Meeting of the Association for Research in Vision and Ophthalmology (ARVO) in Honolulu, Hawaii, on Tuesday, May 1 at 9am.

"These studies highlight how tecnology is changing the way we study, detect, diagnose and treat ocular and visual system disease. hether it is with a cell phone or using web-based products, new technologies are impacting vision research and transforming patient care," says ARVO President Claude Burgoyne, MD, FARVO.

Online vision symptom checkers often misdiagnose

Only 40% of interpretations of vision-related symptoms entered into a popular online symptom checker gave the correct diagnosis in the top three results presented to the user. These results indicate that using online symptom checkers may not be the best option for a patient experiencing vision issues.

Researchers in Ontario, Canada, sought to understand the accuracy of online symptom checkers for vision by entering 42 cases into the online program. Just 26% of the cases presented the correct diagnosis as the top choice, and several cases that require urgent care were identified as non-urgent.

"As more patients present with self-guided research of their eye symptoms, it is important for eye care professionals to be familiar with the capabilities and limitations of popular online symptom checkers," said first author Michael Nguyen of McMaster University. "As a specialty with similar common symptomatic presentations of distinct diseases, ophthalmology may represent a particularly challenging field for online symptom checkers to excel in."

Abstract title: Accuracy of a popular online symptom checker for ophthalmic diagnoses
Presentation start/end time: Wednesday, May 2, 3:30 – 5:15pm
Location: Kamehameha Exhibit Hall
Abstract number**:** 5225 - B0338

Are robots the doctors of the future? Research indicates maybe

A new study shows that patients enjoyed interacting with both human and humanoid robot assistants during standard vision testing.

Twenty-two patients evaluated visual field tests under four different supervisor conditions: human, humanoid robot, computer speaker, and no supervision. No preference was identified between the human and the robot, but both were preferred over the other two options.

Visual field testing takes several minutes and can be boring for both patient and operator, often resulting in minimal supervision during the test. Replacing a human operator for a robotic one may increase clinical efficiency while maintaining clinical outcomes.

“We are exploring ways that technology might improve the experience of visual field testing for both operators and patients,” said first author Allison M. McKendrick, MScOptom, PhD, of the University of Melbourne. “Low patient and operator engagement can lead to inaccurate results and a lack of desire to perform the test as often as recommended.”

Abstract title: Robot assistants for perimetry: Patient experience and performance
Presentation start/end time: Thursday, May 3, 11– 11:15am
Location: Ballroom A
Abstract number**:** 6027

At home testing device screens for common cause of vision loss

Researchers have developed an inexpensive and accurate instrument to monitor the condition of patients with age-related macular degeneration (AMD) at home. The technology may one day offer patients and clinicians a method to monitor the disease’s progression while eliminating the need for monthly visits to the clinic.

In the study, images taken by the at-home OCT were compared to higher resolution images taken by clinical devices. Researchers found that automated interpretation of the images, tracking just a small set of biological indicators, was accurate 90% of the time. Larger scale testing is currently ongoing to achieve the accuracy necessary for clinical use.

“Home monitoring for retinal disorders via optical coherence tomography (OCT) offers huge potential for improving patient care, but cannot be done by today’s clinical devices, which are too expensive and too difficult to use,” said Claus von der Burchard, MD, of the University of Kiel.

AMD is the leading cause of vision loss in people over 50 and impairs a person’s central vision.

Abstract title: Low-Cost Home-Care OCT for AMD with Off-Axis Full-Field Time-Domain OCT – Analysis of Reliability and Feasibility in Disease Monitoring
Presentation start/end time: Wednesday, May 2, 12:15 – 12:30pm
Location: Ballroom BC
Abstract number**:** 4484

Holographic eye tracker to enable monitoring outside of the clinic

Engineers have developed holographic eye tracking technology, paving the way toward a future device that could be worn as a pair of reading glasses to diagnose a variety of vision disorders. The advance may allow doctors to collect information on patient behavior outside of the lab.

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"A low-weight, wearable see-through eye tracker can be used in diagnosing and rectifying eye disorders when the patient is performing daily activities in a natural setting, such as a 7-year old reading or writing at a desk," said Changgeng (Bruce) Liu, PhD, of the University of Illinois at Chicago.

The researchers tested their benchtop prototype on a prosthetic eye model. The eye tracking technology accurately measured movements over a range of motion.

Patient behavior during a formal evaluation in a lab setting can be different than their normal behavior, leading to ambiguous results or misdiagnoses. Data collected in a patient's everyday environment has the potential to be more accurate than that collected in a lab and less burdensome for both patients and physicians.

Abstract title: A holographic waveguide based eye tracking device
Presentation start/end time: Monday, April 30, 3:30 – 5:15pm
Location: Kamehameha Exhibit Hall
Abstract number**:** 2162 - A0331

Virtual reality app makes vision screening mobile
Using a smartphone and Google Cardboard™, scientists have developed an app to enable vision screening by anyone, in any setting. The technology allows patients to monitor themselves, rather than requiring a clinic visit.

Nineteen patients were tested using the mobile app and a traditional visual field testing instrument. The results between the two testing methods showed good agreement. Completing the test with the mobile app took 8.6 minutes, compared to 5.7 minutes for the traditional instrument.

"Visual field testing on personal smartphones can enable vision screening in developing countries where access to expensive equipment and dedicated testing facilities is limited. This is crucial in remote areas where travel time to central testing facilities is prohibitively long or expensive," said Moshe Eizenman, PhD of the University of Toronto.

Abstract title: Visual Field Testing on a Personal Smartphone
Presentation start/end time: Thursday, May 3, 11:30 – 11:45am
Location: Ballroom A
Abstract number**:** 6029

Register as a virtual attendee

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*The **Association for Research in Vision and Ophthalmology (ARVO**) is the largest eye and vision research organization in the world. Members include nearly 11,000 eye and vision researchers from over 75 countries. ARVO advances research worldwide into understanding the visual system and preventing, treating and curing its disorders.*

All abstracts accepted for presentation at the ARVO Annual Meeting represent previously unpublished data and conclusions. This research may be proprietary or may have been submitted for journal publication. Embargo policy: Journalists must seek approval from the presenter(s) before reporting data from paper or poster presentations. Press releases or stories on information presented at the ARVO Annual Meeting may not be released or published until the conclusion of the presentation.