UC San Diego
JACOBS SCHOOL OF ENGINEERING
Center for Wireless Communications

NEWSLETTER
Summer 2020

Message from the Director

Dear CWC Community,

We are now several months deep into the combined socioeconomic crises resulting from the COVID-1 pandemic. Countless among us have had our lives upended by the novel coronavirus. The restrictions of coping with the virus have given us all new opportunities to think creatively and harness technology to continue research and collaboration.

In the midst of the pandemic, CWC has pivoted the focus of two Connected Health projects to COVID-19 research. The first example is our new remote monitoring and digital triaging platform for patients who have tested positive for COVID-19 but are not yet in need of hospitalization. eCOVID has been deployed at UC San Diego Health and Neighborhood Healthcare clinics, helping healthcare teams remotely monitor and prioritize patients based on their criticality and needs, and using AI to provide insights into healing or further progression of COVID-19. Secondly, we are working to develop a smartphone app to track clinician health data and mood assessments. It is our hope that by implementing personalized statistics and machine learning models, we can help monitor a large number of clinicians and potentially assist those in need before a point of crisis is reached. We have also started new projects, including efficient contact tracing and developing a low-cost, low-power wearable sensors to measure key vital signs for COVID-19.

We may live in an uncertain future, but we can be certain of one thing. Time marches on. 2020 is a milestone year as it marks the 25th anniversary of the CWC. The past quarter-century of wireless research at the CWC is recapped in this newsletter by writer Molly Wofford. The changes and advances in the last 25 years are nothing short of incredible.

You can read about these projects and more within the pages of this newsletter. We hope this update brings some measure of hope for a better future—a future both devoid of COVID-19 and rich with wireless solutions for the challenges to come.

Warmest regards,
Sujit Dey
Director
Center for Wireless Communications

Center for Wireless Communications Celebrates 25th Anniversary

In 1995, the UC San Diego Center for Wireless Communications (CWC) was founded on the cusp of the wireless revolution. Twenty-five years later, wireless technology is still rapidly evolving and CWC is celebrating its 25th anniversary by continuing to envision a future of wireless possibilities.

When the CWC was established, the internet had only about 10,000 websites, and cell phones were used almost exclusively for talking. However, many forward-thinking researchers were already imagining a highly collaborative and connected world. Recognizing the potential and need for innovation, the CWC was established as a way to bring together university researchers with industry partners to advance wireless capabilities, and much of its success over the past 25 years has been based on its ability to work with its members to explore the applications of new technology while addressing the technical challenges of wireless advancements.

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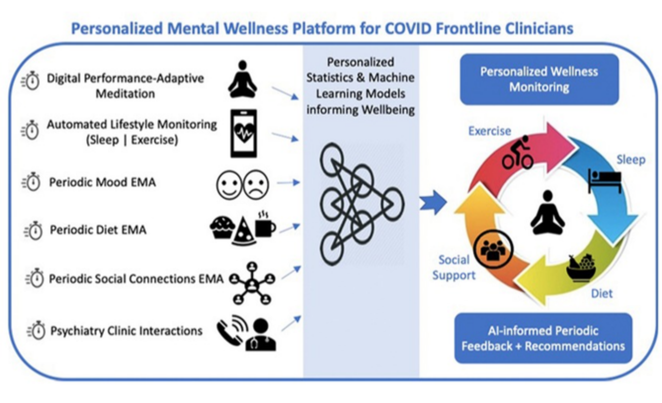
Research News and Highlights

Personalized Mental Wellness Platform for Clinicians during COVID-19



A group of UCSD researchers and engineers have teamed to help address the mental well being of overloaded and stressed clinicians in the current pandemic. The team including **CWC Director** Professor Sujit Dey, **CWC Faculty** Asst. Professor Jyoti Mishra, Associate Clinical Professor Steve Koh (Psychiatry), and Asst. Professor Dhakshi Ramanathan (Psychiatry) has been awarded a **GEM Rapid Response Seed Grant by IEM** for their ongoing work in developing a smartphone app to track clinician health data and mood assessments.

Together, implementing personalized statistics and machine learning models can help monitor a large number of clinicians and potentially assist those in need before a point of crisis is reached.

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eCOVID platform provides remote patient monitoring

Engineers at UC San Diego have developed a remote monitoring platform for patients who have tested positive for COVID-19 but aren't in need of hospitalization. The system is being tested by patients in a clinical trial at UC San Diego Health. It is intended to help health care teams prioritize more critical patients, while also providing data on which symptoms are most indicative of healing or further progression of COVID-19.

Sujit Dey, director of the Center for Wireless Communications, professor of Electrical and Computer Engineering at UC San Diego is the lead of this remote monitoring platform.

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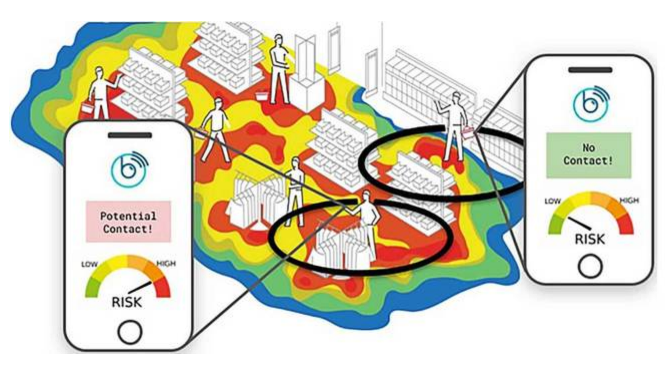
BluBLE: Estimating Your COVID-19 Risk with Accurate Contact Tracing



Motivated by the prospect of creating protective, social-distancing "bubbles" around members of the public, researchers in the UC San Diego Wireless Communications Sensing and Networking Laboratory are developing BluBLE, a new app for contact tracing during the COVID-19 pandemic.

"BluBLE would enable core algorithms to provide accurate contact determination by leveraging my team's expertise in determining robust locations indoors with WiFi and Bluetooth," said **Dinesh Bharadia**, an assistant professor in the Electrical and Computer Engineering Department and the project's Principal Investigator.

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A low-power, low-cost wearable to monitor COVID-19 patients

A research team led by **Professor Patrick Mercier** is developing low-cost, low-power wearable sensors that can measure temperature and respiration--key vital signs used to monitor COVID-19. The devices would transmit data wirelessly to a smartphone and could be used to monitor patients for viral infections that affect temperature and respiration in real-time. The research team plans to develop a device and a manufacturing process in just 12 months. The effort has been funded through a Rapid Response Research (RAPID) grant from the National Science Foundation. COVID-19.

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WiFi-Boosting 'Smart Surface' Could Help Remote Workers and Students

Frustrated with a spotty WiFi connection? Engineers at the University of California San Diego have developed a "smart surface" that could make the signal available in dead spots—and also make the existing connection twice as fast.

"You can stick this on your wall like a painting to improve WiFi connectivity in your home or office," said **Dinesh Bharadia**, a professor with the electrical and computer engineering department at the UC San Diego Jacobs School of Engineering.

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