DIPARTIMENTO DI
INFORMATICA, SISTEMISTICA E
COMUNICAZIONE
Viale Sarca, 336
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ReGAInS

SEMINAR ANNOUNCEMENT

Thursday, 27th June 2024
at 11:00 am
Room "Sala Seminari" - Abacus Building (U14)
and
Online (Google Meet): https://meet.google.com/cce-bxgi-dre

AI and wearable sensors to enable digital medicine

Speaker
Dr Giorgio Quer
Scripps Translational Science Institute

Abstract

At the Scripps Research Digital Trials Center, we leverage wearable sensors to re-engineer the clinical trial experience around the participant, passively and continuously collecting individual data. We process this vast amount of data and develop new algorithms to predict patient outcomes.
In the field of infectious diseases, we proposed DETECT, an app-based, nationwide clinical study to determine if individualized tracking of changes in wearable signals can provide early diagnosis and self-monitoring for COVID-19. We recruited 40,000 individuals and developed algorithms for real-time detection of COVID-19, as well as for monitoring long-COVID and vaccine reactogenicity using wearable sensors. We also prospectively tested the feasibility of returning infection alerts to participants.
On cardiovascular health, we analyzed 400,000 two-week single-lead ECGs and proposed a deep learning technique to predict the occurrence of atrial fibrillation in these individuals. We also demonstrated how to reconstruct the 12-lead electrocardiogram using fewer leads through deep neural networks, utilizing data from 1.6 million individuals.
Our efforts in digital clinical trials also include maternal health, where we proposed the use of wearable sensors to monitor the health of 3000 women before, during, and after pregnancy. Regarding precision nutrition, we are exploring challenges in multi-modal AI to achieve individualized predictions of glycemic response to food for normoglycemic and type 2 diabetics.

Short bio

Giorgio Quer is an Assistant Professor of Digital Medicine at the Department of Integrative Structural and Computational Biology of the Scripps Research Translational Institute, where he leads the AI and Data Science team. His research focuses on artificial intelligence and probabilistic modeling to predict future clinical outcomes. He is involved in several digital medicine initiatives within the Scripps Research Digital Trials Center, and he is also interested in the detection and prediction of atrial fibrillation from single-lead ECG signals.
He received his PhD degree in Information Engineering from the University of Padova, Italy, and worked at UC San Diego, California, before joining Scripps Research.

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