

DIGITAL PHENOTYPING AND HEALTHCARE

Written by [Jennifer Esposito](#) | June 20, 2018



Healthcare is getting better and better at [predicting patient outcomes](#) [\[https://itpeernetwork.intel.com/improving-healthcare-outcomes-artificial-intelligence/\]](https://itpeernetwork.intel.com/improving-healthcare-outcomes-artificial-intelligence/) . AI is getting more adept at interpreting and offering insight from diagnostic data. However, it's not just vital statistics, genomics, and traditional health data that can offer insight. Digital data can also offer insight into patient behaviors and health. Information from fitness trackers, mobile phones,

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WHAT IS DIGITAL PHENOTYPING

“Digital phenotyping [<https://www.hsph.harvard.edu/onnella-lab/research/>] ” is a new term coined by the Harvard T.H. Chan School of Public Health which defines it as “moment-by-moment quantification of the individual-level human phenotype, in situ, using data from personal digital devices, such as smartphones.” Today all of us leave behind a trove of digital breadcrumbs. That data can help catch health problems, and mobile devices are probably the most valuable source of data about someone.

Digital data from smartphones and other devices comes in two major forms: Active and passive data. Active data comprises things like what people say in texts, calls, and social media, which gives us a picture of their relationships, and language they use in the digital world can inform attitude, mood, and cognitive ability. Noting when someone touches their phone at night and in the morning can paint a picture of their sleep habits or sleep problems, and how fast or slowly someone scrolls can indicate behavioral change.

Passive data comes from what their phone is constantly telling the network. A mobile device’s location can clue healthcare professionals in to how active or sedentary someone is, or if they’ve transitioned from a social lifestyle to a more isolated one.

MAJOR PLAYERS IN DIGITAL PHENOTYPING

I had the privilege of seeing a few digital phenotyping luminaries in person at the [2018 HLTH Conference](https://hlth.co/) [<https://hlth.co/>]. A panel called “Digital You” featured John Brownstein, a professor at Harvard Medical School, Steve Levine, a founder and executive director of Dassault Systèmes, and Sachin Jain, president and CEO of CareMore Health. The panel discussed various ways that patient data could be represented virtually. This included 3D printing and VR representations of real patient organs, and more conceptual models of patient data based on sources like mobile devices. In each case, it was exciting to see new opportunities for data and analytics solutions in

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DIGITAL PHENOTYPING, SECURITY, AND ANALYTICS

Digital phenotyping has the potential to solve problems before they start. Using social media or other digital data to diagnose or evaluate patients, however, raises serious questions about security and effectiveness. Timely and effective intervention for people in crisis could provide real benefit, but that also raise questions. For instance, would a third party monitoring digital phenotypes be practicing any kind of medicine? Would they need a license or oversight to do so? This could pose compliance problems as digital phenotyping becomes the norm.

Another challenge is that raw data isn't enough for an effective response system. Effective digital phenotyping also depends on [an effective analytics strategy](https://itpeernetwork.intel.com/benefits-cloud-analytics/) and informed statistical techniques. Without that, digital phenotyping runs the risk of not being clinically valid. The goal here isn't to just look for people saying they're sad, but to analyze language and behavior in such a way that we can find people who are truly at risk.

Digital phenotyping as a public health strategy will have to employ expertise in security, analytics, and psychology, just to start. The emerging field will need to develop a well-defined strategy to sort through user data while simultaneously safeguarding it.

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Jennifer believes that technology has the power to accelerate the transformation of healthcare and to improve health, quality of life, safety, and security worldwide. She works with companies, organizations, and governments around the world to help make this digital transformation real, today. With 20 years of experience, Jennifer brings deep healthcare, life sciences, and biotechnology industry expertise along with a foundation in information and communication technology, and a view that spans across multiple other industries. Jennifer has a graduate degree from the Dartmouth Institute for Health Policy and Clinical Practice at Dartmouth College, where she focused on Epidemiology and Biostatistics. During her time at GE Healthcare, she became a certified Six Sigma Black Belt and remains a full member of the American Association of Physicists in Medicine. Jennifer is the co-chair of the Global Health Security Agenda Private Sector Roundtable and sits on the boards of Digital Square and USA Healthcare Alliance. Follow her @Jennifer_Espo and @IntelHealth.

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