$68 billion

Uber's present market valuation, making the ride-share upstart the most valuable startup worldwide.

Positive Computing: A novel research field to promote human well-being

By Gustavo Fortes Tondello

Technology has undoubtedly improved at vertiginous speeds in recent decades. However, we are not certain if all this technology is helping to increase society's well-being. Rafael Calvo and Dorian Peters, from the Positive Computing Lab at the University of Sydney, have attributed this to the fact that most technology professionals have a machine-focused view of their work, which ignores the user's well-being. Nevertheless, the focus on human well-being has been increasing in human-computer interaction (HCI) research in the last years. Nowadays, there are several projects related to using technology to improve wellness. Calvo and Peters refer to this new research field as "positive computing."

Positive computing is the effort of building technology to support human well-being and help develop human potential. It is a multidisciplinary field, which often involves collaboration between HCI researchers, psychologists, anthropologists, sociologists, physicians, and educators. According to Calvo and Peters, positive computing can be employed in three approaches:

▶ **Preventative design:** Any obstacles or compromises to well-being are treated as a design error and trigger redesign of the application;

▶ **Active design:** Integrating elements to support the user's well-being and human potential even when the application has a different goal;

▶ **Dedicated:** Designing technology that fosters human well-being as its primary goal.

Calvo and Peters also propose a framework for working with positive computing. Design for well-being can be achieved by focusing on one or more of these determinant factors, which are informed by established psychological models:

▶ **Self (intrapersonal) factors:** positive emotions, motivation and engagement, self-awareness, mindfulness, and resilience.

▶ **Social (interpersonal) factors:** gratitude and empathy.

▶ **Transcendent (extra-personal) factors:** compassion and altruism.

Positive computing is a very novel, multidisciplinary research field. It was promoted at ACM CHI 2016, as part of the Computing in Mental Health workshop as well as the course "Designing Technology for Wellbeing." The workshop—now known as the Second Symposia on Computing and Mental Health—returned to CHI 2017, where Peters and Calvo also led the course "Positive Computing: Research & Practice in Wellbeing Technology."

An example of positive computing research is the collection of projects collectively known as "Games for Health," which aim to take advantage of the power of games to improve people's health. There are currently hundreds of active projects on Games for Health. A good example of a game for health is Re-mission, published by the HopeLab Foundation. In the game, players enter the human body as microscopic robots to fight cancer. By playing this entertaining game, cancer patients learn about their body and the various treatments for their illness, gain a sense of control and power, and become more engaged with the treatments. Several studies with young patients showed the game strongly activates brain circuits involved in positive emotion, leading to more consistent treatment adherence, faster rate of learning about the illness, and a faster rate of increase in self-efficacy. This is just one of the many examples of positive computing applied to solve real-world problems. This field promises to achieve many favorable outcomes in the future.

ADDITIONAL RESOURCES

▶ Positive Computing; www.positivecomputing.org
▶ Games for Health; www.gamesforhealth.org
▶ Re-mission; www.re-mission.net
▶ Rafael Calvo and Dorian Peters. *Positive Computing: Technology for Wellbeing and Human Potential.* The MIT Press, 2014.

Biography

Gustavo Fortes Tondello is a Ph.D. student in computer science at the University of Waterloo, Canada. His main interests include gamification and games for health and learning. His research focuses on the design and personalization of gameful applications.

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