Training, Education and Development of a Transdisciplinary mHealth Workforce

Vivek Shetty      Santosh Kumar

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Develop and enable a sustainable community of transdisciplinary mHealth data scientists and translational researchers
- Student-led
- Graduate Students
  - MD2K
  - Collaborating Teams
- Students
  - Review research papers
  - Present own research work
Dr. Tiffany Cvrkél: Bioethics and Big Data

Please join us at 3 p.m. CT on February 18, 2016 for a webinar sponsored by Dr. Tiffany Cvrkél. In this webinar, she will discuss the ethical and legal challenges associated with Big Data.

About the webinar

The Big Data Revolution promises enormous potential in acquisition and application of vast arrays of data and its possibilities in research and clinical practice. With the type of data being generated and stored, it is critical to consider the purpose of data collection and its use. This webinar will discuss some of the major ethical challenges around Big Data. This will involve looking carefully at issues around data ownership, privacy, transparency, and consent. Second, we will move beyond the listing of problems onto some possible solutions. Here we will suggest practices for data management, policies for data sharing and the role of researchers and institutions in doing to address the ethical issues.

About the presenter

Dr. Tiffany Cvrkél is a bioethicist, philosopher, and lecturer in UCLA’s Department of Molecular, Cell, and Environmental Biology. Her research focuses on the ethical and legal issues of governing bioinformatics, genomics, and the ethics of biomedical research. She is particularly concerned with the ethical challenges of emerging biomedical technologies, including the ethical challenges around eHealth, mHealth, and Big Data. In addition to being an award-winning teacher, she serves as a consultant to scientists and clinicians working with bioethical questions. She specializes in both bringing clarity to bioethical challenges and to assisting in the creation of practical solutions.
NSF awards $4 million to create a provenance cyberinfrastructure to enable sharing of high-frequency mobile sensor data.

A team of researchers from four universities—UCLA, UC San Francisco, University of Memphis, and University of Pennsylvania—have been awarded a new data cyber-infrastructure grant by the National Science Foundation (NSF). The team will develop a new cyberinfrastructure called mProv, to associate high-frequency mobile sensor data with data source, quality, and semantics to facilitate sharing of such data with the larger research community. The project, mProv: Provenance-based Data Analytics Cyberinfrastructure for High-frequency Mobile Sensor Data, will be led by Dr. Santosh Kumar, a professor and Moss Chair of Excellence in Computer Sciences. Dr. Zhehao In, a computer scientist, will lead the University of Pennsylvania team. Dr. Ida Sim, a professor of Medicine and medical informatics, will lead the UCSF site, and Dr. Matt Sch.Assistore, an electrical engineer and computer scientist, will lead the UCLA team.

Kumar to present OBSSR Director's Seminar

Santosh Kumar, director of the MD2K Center of Excellence, will present a seminar on "Risks for mHealth: Collecting High-Frequency Mobile Sensor Data for Long-Term ResearchUtility," as part of a Director's Seminar series sponsored by the Office of Behavioral and Social Sciences Research at the National Institutes of Health.

The seminar will be at 1 p.m. ET on November 13.

Dr. Kumar's talk will discuss the implications of collecting digital mobile sensor data in a way that allows it to be reprocessed for future research use, in the same way biomedical studies analyze specimens in biobanks for future use. The talk will also discuss current MD2K research and the software to support reanalysis research studies.

To sign up for the webinar, go here.

MD2K Webinar: Isaac Potoczny-Jones on protecting user privacy, data

Upcoming webinar: Santosh Kumar, Cary Clifford on mobile health analytics

Dr. Santosh Kumar and Dr. Cary Clifford will speak Nov. 3 at a roundtable on "Mobile Health Analytics: Addressing Cancer in the Southern United States," as part of the South Big Data Hub's monthly series on emerging data science challenges.

The webinar will be noon-1:30 p.m. ET and can be accessed via WebEx here. Dr. Lee Shalinsky, South Hub co-Executive Director of the South Big Data Hub, will moderate.

The webinar will explore the science challenges of mobile health informatics, critical care data analytics, and the application of high-performance and large-scale learning to address health disparities in the Southern United States.

MD2K Webinar: Dr. Benjamin Marlin on "Machine Learning Methods for Mobile Health Research"

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Web Resources

MD2K Troubleshooting Guide

If you are experiencing bad data quality:

- Make sure the Placement setting is designated for the correct wrist.
- Make sure the clasp on the Band is securely locked around the wrist.
- Reset the application, wait 15 seconds and check again.
- Restart the phone, wait one minute and check again.
- Make sure the Band is charged and powered ON.

If you are experiencing pairing issues:

- Check that the phone's Bluetooth is turned on and discoverable.
- Make sure the phone is not too far from the Band.
- Ensure that the Band is not too far from the phone.
- Clear the Band's paired list and try again.
- Reset the Band and try again.

Microsoft Band

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Introduction
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2016 mHealth Training Institute
August 8-12, 2016
University of California, Los Angeles

Immersive blended learning with mHealth thought leaders

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mHealth Scholars

- 70 graduates
- 15 disciplines
- 88%: Junior/Mid-level Faculty
- 67% females
- 30% minorities

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Blended Learning
Blended Learning
Team Science

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Capstone Presentation

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# Evaluation

## Motivation (situation/need)

Developers of mHealth solutions are trained and work within disciplinary silos. As a result, current solutions often suffer from a lack of clinical utility and have fairly limited impact.

## Institute Activities (design/implementation)

<table>
<thead>
<tr>
<th>Didactic Core</th>
<th>Transdisciplinary Team-Based Project</th>
<th>Social Networking</th>
<th>mHealthHUB</th>
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</thead>
<tbody>
<tr>
<td>• devices</td>
<td>• team learning</td>
<td>ongoing collaboration</td>
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<td>• data security</td>
<td>• faculty mentoring</td>
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<td>• data analysis</td>
<td>• capstone presentation</td>
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<td>• user interface</td>
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<td>• applications</td>
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<td>• funding</td>
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## Outcomes

<table>
<thead>
<tr>
<th>Recognition</th>
<th>Self-efficacy</th>
<th>Access to an Expanded Network</th>
<th>Actualization</th>
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<tbody>
<tr>
<td>appreciation of multiple disciplinary perspectives – CDTL Identification and Recognition Scales</td>
<td>to initiate/execute collaborations – CDTL Integration Scale</td>
<td>within and across disciplines</td>
<td>increase in mHealth-related collaborative practices – portfolio review, Levels of Collaboration Survey</td>
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## Moderating Effect of Institutional Infrastructure

for cross-disciplinary collaborations – Institutional Support Scale
Evaluation

Appreciation of multiple disciplinary perspectives in mHealth research and development (5-item scale).

Indicate the extent to which you believe it is true for research and development work related to mHealth (1=strongly disagree, 7=strongly agree)...

I can clearly identify the type of knowledge and skills I could bring to engaging in research and development.

I can discuss the contributions other disciplines have made to my own research and development.

<table>
<thead>
<tr>
<th>Sample</th>
<th>N</th>
<th>pretest M</th>
<th>pretest SD</th>
<th>posttest M</th>
<th>posttest SD</th>
<th>posttest vs. pretest</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>DM</td>
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<tr>
<td>Cohort 1</td>
<td>25</td>
<td></td>
<td></td>
<td>5.48</td>
<td>0.80</td>
<td>6.11</td>
</tr>
<tr>
<td>Cohort 2</td>
<td>30</td>
<td></td>
<td></td>
<td>4.91</td>
<td>1.00</td>
<td>6.14</td>
</tr>
<tr>
<td>Combined</td>
<td>55</td>
<td></td>
<td></td>
<td>5.17</td>
<td>0.95</td>
<td>6.13</td>
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N is number of participants with matched pre- and posttest responses. M and SD are mean and standard deviation of total score for the 5-item mHealth Recognition scale. DM is the difference in means (posttest minus pretest); t-statistic and p-value are shown for a paired-sample t-test. Effect size is the standardized mean difference (posttest minus pretest).
Evaluation

….I heard that this was a really valuable experience for them, and several of them have told me that this was one of the most valuable things they have done professionally in their careers.

……The mHealth Summer Institute has already left an imprint on me and how I think about my research. As an early investigator, the mHealth Summer Institute will be one of those seminal experiences in my career development that I will never forget and always be grateful for. Thank you again for the opportunity!
Resources for BD2K Community

- MD2K software
- manuals
- training videos
- Discussion Forums
- Archived
  - Webinars
  - mHTI Lectures
- Curated research papers
2017 mHealth Training Institute
University of California, Los Angeles
August 6-11, 2017

MD2K.org

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