CS 599: Information and Communication Technologies and International Development
Spring 2016
Time: MW 1:30-2:50pm
Instructor: Kurtis Heimerl <kheimerl@cs.washington.edu>
TA: Aditya Vashistha <adityav@cs.washington.edu>
Location: MGH 082A
Office Hours: Aditya Vashistha (Tuesday 3-4pm, CSE 220 Allen Center)
Hedged from (https://technologyandpoverty.org/syllabus/)

Course Description:
Information and Communication Technologies (ICTs) are having enormous impact on the livelihoods of the world, from tech workers taking Uber to work, to farmers using online forums to share best practices, to people in rural areas using cellular phones to stay up to date on their children in the big city. Often ICTs take power away from disadvantaged communities (e.g., rural) and centralize it in those with the money and knowhow to use the technologies. As these interventions sweep through communities throughout the world, we strive to understand how to build technologies that instead empower and support marginalized groups. This class will focus on exploring how to build technologies for communities that you are not a part of (short answer, get involved!), understanding the space of people and organizations engaging with and solving these kinds of problems (from Facebook to the Clinton Health Initiative to Ob Anggen), and eventually building our own (likely naive) solutions.

While a critical theory of development is important to doing good work, this is a class for builders and designers. All students will complete a project and end up with an artifact; potentially a tool (designed and/or built) for empowering community health workers or a model for mapping satellite data to population density. This is a graduate-level computer science class but particularly motivated and experienced students (including undergrads) from other disciplines can reach out if they'd like to participate.

Grading:
80% Projects: Projects of 2-4 students that somehow interact with the ICTD field. Eventually need to produce an artifact: a program, model, or design for a solution to a problem. Project proposals are [here](#).

Project Presentations:

Your projects are due Wednesday, December 14th at 1PM. At that time we will be having a poster session at the CSE atrium where you will be presenting your work. Drinks will be provided. At this session you are to bring:

1. A full size poster in any standard poster format (i.e., no "print 9 slides out" business). This will be presented in a group to me and other passerbys through the atrium. It should

describe your project, problem, background, and solution (as far as you made it). Demos always appreciated.

2. A 6-10 page writeup of the work in two-column CHI format (http://www.sigchi.org/publications/chipubform/sigchi-paper-format-2016/view). This should look very similar to the Computer Science papers you've read throughout the class: Abstract, Introduction, Related Work, Content, Discussion, Conclusion. Those of you from Computer Science will be graded *much* more hardly on formatting; part of the goal of this exercise is to practice paper writing as well.

Project proposals are due Wednesday the 19th.

The general format is a 1-4 page paper in academic format (2 column) detailing:
1) Who is on your team?
2) What is the problem you are trying to solve?
3) What are some existing solutions (really lightweight related work)?
4) What is your design/solution?
5) What technologies are you leveraging to build your design/solution?
6) How do you plan (or hope) to evaluate your design/solution?
7) A general timeline for tasks over the next two months to the deadline of December 7th.

With these proposals in place Aditya and I will be scheduling some meetings to discuss the proposals.

Please **email the proposals** to Aditya and I by **Wednesday the 19th.**

10% Paper Writeups: A one-paragraph writeup of *each* reading with what you, as a reader, found interesting about this work. This means you'll generate 3 writeups for three papers and post them on our message board here: https://catalyst.uw.edu/gopost/board/adityav/43219/ This will be used to give direction to presenters.

10% In-class participation (leading discussions on papers): Each student will be asked to present (as a group) an area of ICTD. The sections labeled "areas" below are the ones available. The scheduling of these will be done by October 5th. Sign up for your lecture here.

Course Schedule:

September 28:
Introductions to the field and to each other
Readings:
- Eric Brewer, Michael Demmer, Bowei Du, Melissa Ho, Matthew Kam, Sergiu Nedevschi, Joyojeet Pal, Rabin Patra, Sonesh Surana, Kevin Fall, "The Case for Technology in Developing Regions", Computer, vol.38, no. 6, pp. 25-38, June 2005, doi:10.1109/MC.2005.204

October 3:

What is development?

Readings:

- Thomas, A. (2000). "Meanings and Views of Development" In T. Allen and A. Thomas (Eds) Poverty and Development into the 21st Century, 23-51. Oxford University Press. (to be shared via mailing list)
- Sen, A. (2001). "What is Development About?" In Meier, G. and J. Stiglitz (Eds) Frontiers of Development Economics: The Future in Perspective, 506-513. Oxford University Press.
- Kentaro Toyama. 2011. Technology as amplifier in international development. In Proceedings of the 2011 iConference (iConference '11). ACM, New York, NY, USA, 75-82.

October 5:

Projects: Make teams, pick projects. Students interested in their own stuff can present in this section.

Readings:

- List of project suggestions.

October 10:

What is Poverty? Metrics.

Readings:

- Banerjee, A. & Duflo, E. (2011). "Think again, again" in Poor economics: A radical rethinking of the way to fight global poverty. PublicAffairs. (to be shared via mailing list)
- Gates, B. (2013). "GDP is a terrible way to measure a country's economy and it hinders our ability to help the poor." In Slate

October 12:

Top down vs Bottom up: Methods for development

Readings:

- Parayil, G. (1992). "The Green Revolution in India: A Case Study of Technological Change." Technology and Culture, 737–756.
- c (2006). The microtelco opportunity: Evidence from Latin America. Information Technologies & International Development, 3(2), 73–86.

October 17:

Design

Readings:

- Kam, M., Mathur, A., Kumar, A., and Canny, J. (2009). Designing digital games for rural children: a study of traditional village games in India. In Human Factors in Computing Systems.
- Irani, L., Vertesi, J., Dourish, P., Philip, K., and Grinter, R. E. (2010). Postcolonial computing: a lens on design and development. In Human Factors in Computing Systems, 1311–1320. Technology & Poverty | Spring 2016

October 19:

History of ICTD: Fast-forward through 20 years of stuff like the "digital divide"

Readings:

- [Harry S. Truman's Inaugural Speech](), delivered January 20, 1949. (Focus on the sentences following "Fourth, we must embark on a bold new program...")
- Keniston, K. (2004). "[Introduction: The Four Digital Divides.]()" in K. Keniston and R. Kumar (Eds) Experience in India: Bridging the Digital Divide, Sage Publications, 11-36.
- [The Fortune at the Bottom of the Pyramid]() by C.K. Prahalad and Stuart L. Hart

October 24:

Projects 2: Meeting with Aditya/Kurtis about project process and direction.

Readings:

- None.

October 26:

Modern ICTD: FB/Google/AID interventions. Media.

Readings:

- Genevieve Gebhart. 2016. [Zero-rating in emerging mobile markets: Free Basics and Wikipedia Zero in Ghana.]() In Proceedings of the Eighth International Conference on Information and Communication Technologies and Development (ICTD '16). ACM, New York, NY, USA, , Article 16 , 9 pages. DOI: [http://dx.doi.org/10.1145/2909609.2909663]()
- [The Short-term Impact Of Unconditional Cash Transfers To The Poor: Experimental Evidence From Kenya]() Johannes Haushofer and Jeremy Shapiro
- Extra stuff (for debate):
  - [Project Loon]()
  - [Poor internet for poor people: Why Facebook's Internet.org amounts to economic racism]()

October 31:

Areas: Health.

Readings:

- Brian DeRenzi , Neal Lesh , Tapan Parikh , Clayton Sims , Werner Maokla , Mwajuma Chemba , Yuna Hamisi , David S hellenberg , Marc Mitchell , Gaetano Borriello, [e-IMCI: Improving Pediatric Health Care in Low-Income Countries](), Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.
- [Quantifying the Impact of Human Mobility on Malaria]() By Amy Wesolowski, Nathan Eagle, Andrew J. Tatem, David L. Smith, Abdisalan M. Noor, Robert W. Snow, Caroline O. Buckee, Science 12 Oct 2012 : 267-270

November 2:

Areas: Agriculture

Readings:

- Oreglia, E. (2013). [When technology doesn't fit: information sharing practices among farmers in rural China.](#) In Proceedings of the Sixth International Conference on Information and Communication Technologies and Development.
- [Digital Green: Participatory Video and Mediated Instruction for Agricultural Extension](#) Rikin Gandhi, Rajesh Veeraraghavan, Kentaro Toyama, Vanaja Ramprasad
- OPTIONAL: Patel, N., Chittamuru, D., Jain, A., Dave, P., & Parikh, T. S. (2010). [Avaaj otalo: a field study of an interactive voice forum for small farmers in rural india.](#) In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.

November 7:
Areas: Access/Infrastructure
Readings:
- Sonesh Surana, Rabin Patra, Sergiu Nedevschi, Manuel Ramos, Lakshminarayanan Subramanian, Yahel Ben-David, and Eric Brewer. 2008. [Beyond Pilots: Keeping Rural Wireless Networks Alive](#). In Proceedings of the 5th USENIX Symposium on Networked Systems Design and Implementation (NSDI'08), Jon Crowcroft and Mike Dahlin (Eds.). USENIX Association, Berkeley, CA, USA, 119-132.
- Choose one:
  - [The Village Telco project: a reliable and practical wireless mesh telephony infrastructure](#) Michael Adeyeye and Paul Gardner-Stephen EURASIP Journal on Wireless Communications and Networking 2011
  - [A Longitudinal Study of Local, Sustainable, Small-Scale Cellular Networks](#) Kurtis Heimerl, Shaddi Hasan, Kashif Ali, Eric Brewer, Tapan Parikh. Information Technologies & International Development (ITID) 2015

November 9:
Areas: Liberation Technologies
Readings:
- Meghana Marathe, Jacki O'Neill, Paromita Pain, and William Thies. [Revisiting CGNet Swara and its Impact in Rural India.](#) In International Conference on Information and Communication Technologies and Development (ICTD), 2015.
- [Building Dissent Networks: Towards Effective Countermeasures against Large-Scale Communications Blackouts](#) S. Hasan, Y. Ben-David, G. Fanti, E. Brewer, and S. Shenker. USENIX FOCI 2013
- A. Reynolds, J. King, S. Meinrath, and T. Gideon. [The Commotion Wireless project.](#) In Proceedings of the 6th ACM Workshop on Challenged Networks, pages 1–2. ACM, 2011.
- [Why did the Twitter revolutions fail?](#) NY Times

November 14:
Areas: Behavior Change/Entertainment as Development
Readings:

- Thomas N. Smyth, Satish Kumar, Indrani Medhi, and Kentaro Toyama. 2010. Where there's a will there's a way: mobile media sharing in urban india. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10).
- Agha Ali Raza, Farhan Ul Haq, Zain Tariq, Mansoor Pervaiz, Samia Razaq, Umar Saif and Roni Rosenfeld, Job Opportunities through Entertainment: Virally Spread Speech-Based Services for Low-Literate Users, in Proceedings of the 2013 ACM SIGCHI Conference on Human Factors in Computing Systems.

November 16:
Areas: Markets
Readings:
- Jensen, R. (2007). The digital provide: Information (technology), market performance, and welfare in the South Indian fisheries sector. The quarterly journal of economics, 879-924.
- Srinivasan, J., & Burrell, J. (2013). Revisiting the fishers of Kerala, India. In Proceedings of the Sixth International Conference on Information and Communication Technologies and Development

November 21/23: Kurtis and Aditya traveling. No class.

November 28:
Areas: Money
Readings:
- "What Makes a Successful Mobile Money Implementation? Learnings from M-Pesa in Kenya and Tanzania." Mobile Money for the Unbanked. Rutherford, S. (2009).
- Blumenstock, J. E., Callen, M., Ghani, T., & Koepke, L. (2015). Promises and pitfalls of mobile money in Afghanistan: evidence from a randomized control trial. In Proceedings of the Seventh International Conference on Information and Communication Technologies and Development (p. 15). ACM.
- (Optional) "The Poor and Their Money: An Essay about Financial Services for Poor People." Institute for Development Policy and Management, University of Manchester. (1999)

November 30:
Areas: Data
Readings:
- Data in the First Mile, by Kuang Chen , Joseph M. Hellerstein , Tapan S. Parikh
- Hartung, Carl and Lerer, Adam and Anokwa, Yaw and Tseng, Clint and Brunette, Waylon and Borriello, Gaetano (2010). Open data kit: tools to build information services for developing regions. In Proceedings of the 4th ACM/IEEE International Conference on Information and Communication Technologies and Development. ACM.
- Dell, N., Perrier, T., Kumar, N., Lee, M., Powers, R., & Borriello, G. (2015). Paper-Digital Workflows in Global Development Organizations. In Proceedings of the 18th ACM

Conference on Computer Supported Cooperative Work & Social Computing (pp. 1659-1669). ACM.

December 5:
Projects 3: Almost there! Last class session to give people time to finish stuff.
Readings:
- None.

December 7:
Poster Session! Present your work.
Readings:
- None.

- Warschauer, M., & Ames, M. (2010). Can One Laptop per Child save the world's poor?. Journal of International Affairs, 64(1), 33.
  Alternate link: https://www.ciaonet.org/catalog/21981