Information and Communication Technology for Development

Autumn 2018

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Today: Course Overview

- What is information and computing for development?
- Course organization
- Homework 1
- Projects
- Background

Course organization

- Course organized by technology
  - Other options
    - By use case
    - By domain

Lecture	Date	Topic	Reading	Lecturer	Slides
Lecture 1	Wednesday, September 26	Course Introduction			
Lecture 2	Friday, September 28	Mobile Phones			
Lecture 3	Monday, October 1	Communication Infrastructure			
Lecture 4	Wednesday, October 3	SMS Applications			
Lecture 5	Friday, October 5	Voice Applications			
Lecture 6	Monday, October 8	Mobile Money			
Lecture 7	Wednesday, October 10	TBD			
Lecture 8	Friday, October 12	TBD			
Lecture 9	Monday, October 15	TBD			
Lecture 10	Wednesday, October 17	Networking technologies			
Lecture 11	Friday, October 19	Caching technologies			
Lecture 12	Monday, October 22	Global goods software			
Lecture 13	Wednesday, October 24	Software Architecture			
Lecture 14	Friday, October 26	TBD			
Lecture 15	Monday, October 29	TBD			
Lecture 16	Wednesday, October 31	TBD			
Lecture 17	Friday, November 2	Low Literate UIs			
Lecture 18	Monday, November 5	Data Collection			
Lecture 19	Wednesday, November 7	Task Support			
Lecture 20	Friday, November 9	Mobile Wallet Applications			
Veteran's Day	Monday, November 12				
Lecture 21	Wednesday, November 14	Multimedia			
Lecture 22	Friday, November 16	TBD			
Lecture 23	Monday, November 19	TBD			
Lecture 24	Wednesday, November 21	Data Cleaning			
Black Friday	Friday, November 23				
Lecture 25	Monday, November 26	Vision Applications			
Lecture 26	Wednesday, November 28	Call Data Records			
Lecture 27	Friday, November 30	Ride sharing			
Lecture 28	Monday, December 3	Language Processing			
Lecture 29	Wednesday, December 5	TBD			
Lecture 30	Friday, December 7	TBD			

Course mechanics

- Lectures, MWF
- Thursday quiz section
- TAs: Naveena Karusala and Samia Ibtasam
- Short, required readings
- Additional optional readings
- Weekly assignments
  - Usually written
  - Submit online, word or PDF
- Four programming assignments
- No term project
- No final exams

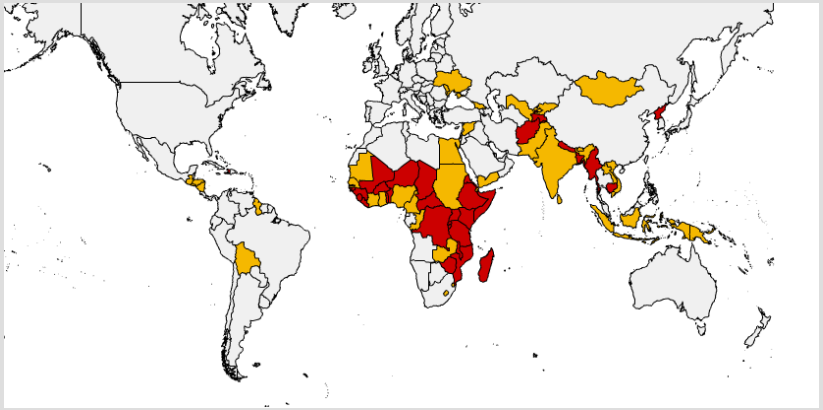
http://courses.cs.washington.edu/courses/cse490c/18au

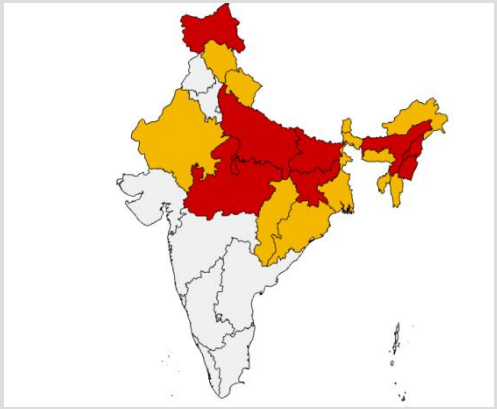
Figure out part 1a by quiz section

Assignment posted on website

Assignment 1a

- Pick three countries to become an 'expert' on
  - Assignments will often require specializing questions to countries, so pick countries in advance so you acquire background
  - Choose LICs (Low income countries) or LMICs (Low-middle income countries) but not UMICs or HICs
  - If you want to work with India, choose a low income state of India

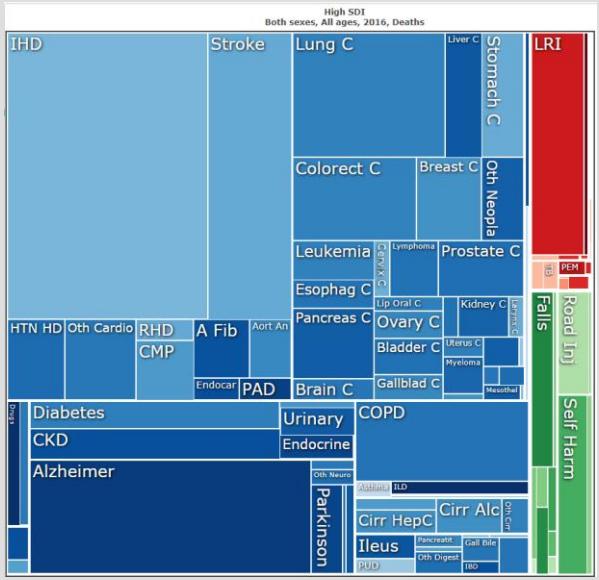


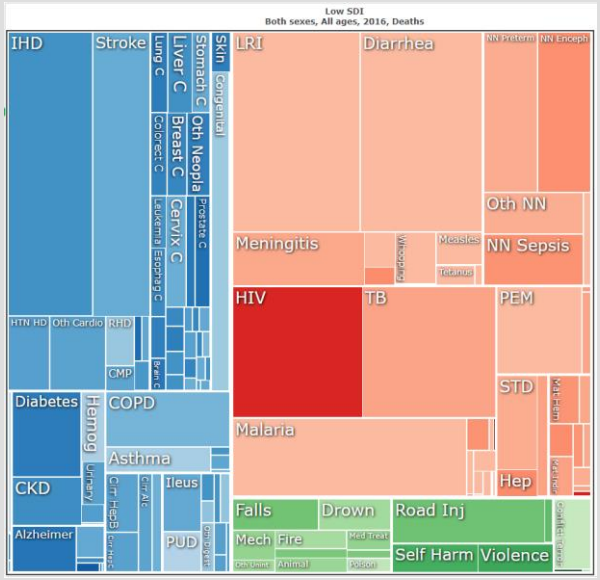


Assignment 1b

- Write a summary of the health challenges of your three countries. Compare with a high income country such as the United States. Use IHME's GBD visualization tool as a data source.

http://www.healthdata.org/results/data-visualizations





Assignment 1c

- Conduct an assessment mobile phone usage in your three countries using online resources
- Areas of investigation should include
  - What are the major cell phone companies
  - How much of the country is covered
  - What percentage of the population has access to mobile phones
  - What types of handsets are in use
  - What is the market share of smart phones
  - How much is the cost of voice, sms and data

Development Background

- Domains of interest
  - Health, Education, Agriculture, Livelihood, Infrastructure
- Infrastructure and Economic constraints
  - Low connectivity, poor electrical power, limited financial resources, limited literacy, shortage of technological talent
- Structure of development
  - Global development and agendas
  - Country level
  - Market driven

Millennium development goals

- International development goals established by United Nations in 2000
- Targets results by end of 2015

Millennium development goals

1. To eradicate extreme poverty and hunger
2. To achieve universal primary education
3. To promote gender equality and empower women
4. To reduce child mortality
5. To improve maternal health
6. To combat HIV/AIDS, malaria, and other diseases
7. To ensure environmental sustainability
8. To develop a global partnership for development

Sustainable Development Goals

- New global goals through 2030
  - 17 Goals with 169 Targets

Sustainable Development Goals

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Global Technology and Development Stakeholders

- Global Organizations
- Donors
- Implementing NGOs
- Research Establishment
- Technology NGOs
- Tech Industry
- Government
- Local NGOs and Civil Society

Unit 1: Mobile Phones and Communication

- Mobile phones are the critical computational infrastructure in many settings
- Cellular infrastructure
  - Handsets and networks
- Mobile phone applications
  - Bringing services to people with basic mobile phones

Unit 2: Systems and Software

- Computing systems for ICTD
- Networking infrastructure and challenges
- Global good software
  - Core applications
  - Architecture
  - Open Source

Unit 3: Mobile Computing and HCI

- Low cost smart phones are becoming widespread
- Mobile Applications
  - User interface design
  - Data collection
  - Task support
- Digital Financial Services

Unit 4: AI and Big Data

- Managing Data and Data Cleaning
- Applications of Computer Vision
  - Satellite image interpretation
- What can be done with cell phone data?
- Other applications
  - Ride sharing
  - Natural Language Processing

Programming Assignments

1. Build a two way SMS Application using Twilio
2. Develop an Immunization Registry (or an another “Global Good”)
3. Create a low-literate user interface for a mobile money system
4. Data Science: Most likely an assignment based on satellite image interpretation or call data records