



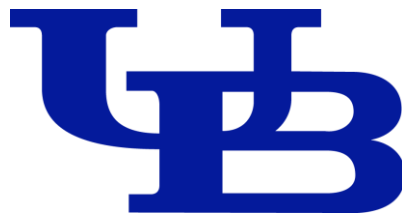
Disaster Mode



Smartphone Disaster Mode

Saving lives with cyber-physical systems

Matt Adam, Geoffrey Challen, Chris Renschler,
Sriram Shantharam, Nishanth Vashit, Misa Yasumiishi
University at Buffalo



Smartphones: Powerful, Ubiquitous...



164 million smartphone users in the US in 2014



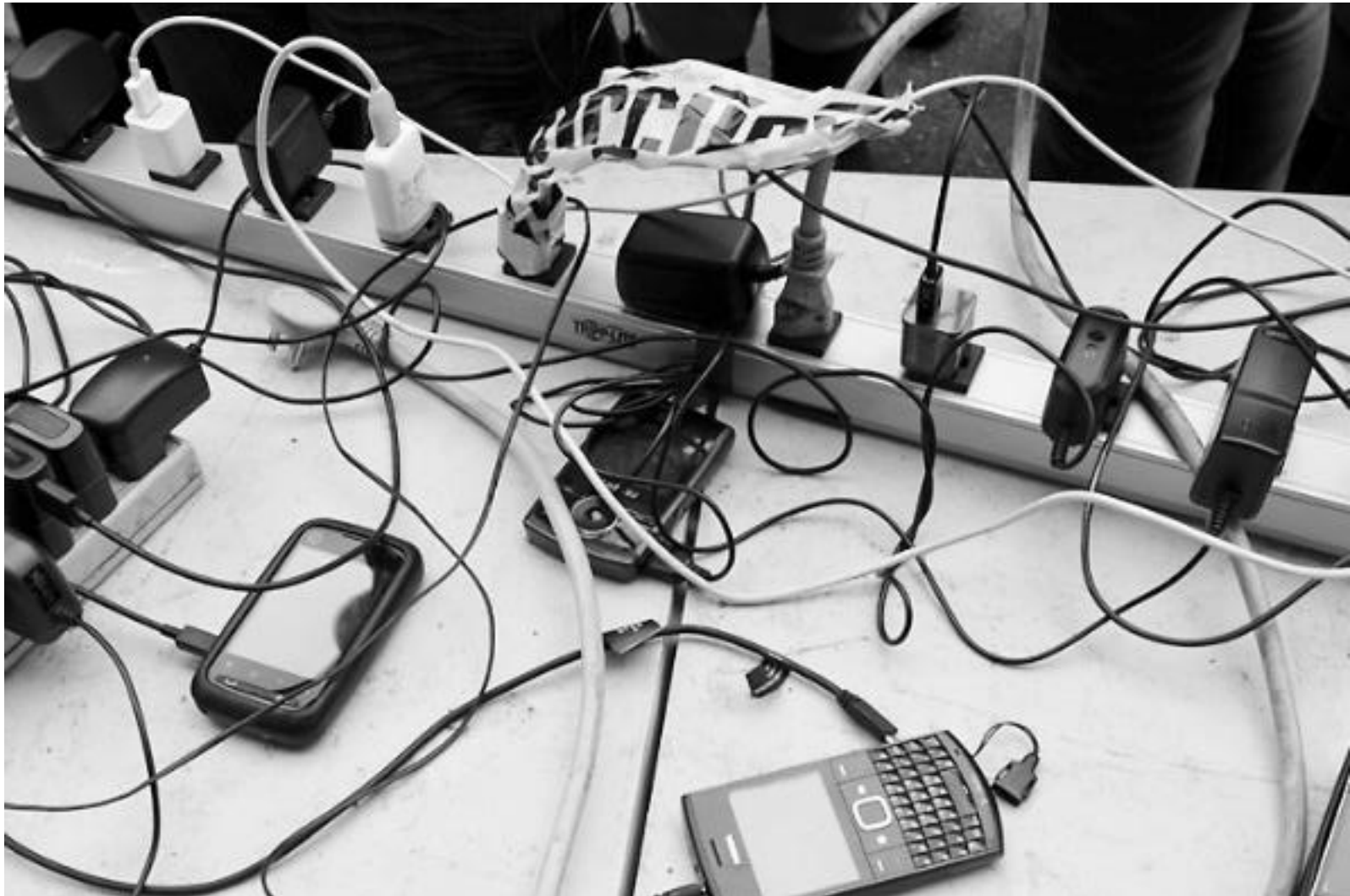
Disaster Mode

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<http://blue.cse.buffalo.edu/projects/disaster-mode>



... Except During Disasters



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Smartphones During Sandy



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Smartphones During Sandy



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Addressing the Challenges

	Normal Mode	Disaster Mode
Power	Plentiful	Scarce
Connectivity	Common	Rare
User Behavior	Typical	Atypical
Dependency	Essential	Critical



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Reducing Power Consumption



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Reducing Power Consumption



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Realizing the Potential

Disaster mode similar to airplane mode

- Before
 - Identify vulnerable individuals and communities
 - Help allocate scarce disaster resources
- During
 - Remain useful
 - Self-organize into a per-disaster CPS to improve survivability
 - Help authorities track unfolding events



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Determining Vulnerability



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Determining Vulnerability



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Current Status

- Smartphone
 - Testing and implementing energy management features targeting the display and network
- PEOPLES
 - Integrating data streams from PhoneLab smartphones to improve vulnerability estimation
- Testing
 - Working with the Seneca Nation to integrate disaster mode into a disaster drill



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More Research Is Needed

Unlocking smartphones' potential during disasters requires new research into

- extreme energy management
- low-power localization and navigation
- peer-to-peer communication
- interaction with infrastructure
- improve resilience models
- quantifying social connectedness



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When Disaster Strikes...

Stop taking care of your smartphone.

Runs out of battery

Can't connect

Useless

Don't worry,
I know another way.

zzzz.....



Start letting it take care of you.

Battery lasts for days

Contact loved ones

Navigate to safety

Help others



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Saving lives with smartphones