Smart Cities Institute Launch
March 1-2, 2018

@Metro21CMU  #Metro21Institute
Carnegie Mellon University
SUMMARY OF METRO21: SMART CITIES INSTITUTE LAUNCH EVENT

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• Metro21: Smart Cities Institute is a campus-wide initiative encompassing CMU’s work at the intersection of technology and humanity
• We are at a CRITICAL inflection point in the opportunity to tap the power of scientific research and innovation to address the most intractable challenges facing our rapidly growing cities; time is NOW to act
Rich Fitzgerald
County Executive, Allegheny County

- How far Pittsburgh has come - from people thinking the idea of transforming Pittsburgh’s economy as a silly, impossible idea to a significant change.
- Now Metro21 is launching a new idea - that Pittsburgh can be a premier city by leveraging its research and municipal resources.
Karina Ricks

Director, Department of Mobility and Infrastructure, City of Pittsburgh

• Research into new technologies is important, which is why the partnership between the city and CMU is crucial.
• The city can benefit from research coming from everything Carnegie Mellon has to offer, from materials science to public policy.
• The city will continue to transform with the help of institutions like Carnegie Mellon and Metro21.
• Technology is not ethics-neutral – it can magnify inequality; the costs are high
• We need to “optimize for the right things” with ethics baked in
• We have the resources to build a world that works for everyone but what’s missing is the framing of thinking of things in terms of abundance and equity; we need to make it foundational not ancillary
• We need to build back trust in science and technology – we can pull off this challenge and as long you address these issues – Heinz Endowments will support you
Raj Rajkumar

Director, Metro21: Smart Cities Institute

• Goal is a metro system of systems to a fine-tuned Swiss watch to a smart watch – adding applications
• Trust is an important component to building a smart city
• Metro21 is a change agent; need to work with partners to transition the innovation into practical environment (the “real world”) – innovation as a “force of good”
• We hope to build a science of smart cities; with considerations of policy implications (can we model the genome sequence of living/breathing organism of a city – can we inject "new genes" and address a metro’s challenges – no better place than CMU
• We are looking to leverage innovations in technology, policy, and their interplay to have a positive impact on metropolitan societies. We view technology as a force for good.
Key Points

- Cities are made of people. You can't abstract people out from these systems. It must be “personalized and participating” & based on the use cases (delivering to those needs)
- The workforce needs high quality education that helps individuals adapt to the rapid changes in technology. One size doesn't fit all - good education is local.
- It’s going to take a triumvirate of leadership and partnership: CMU, municipal partners and industry = but need a viable funding model
- Metro21 needs to coordinate and leverage technology; and focus “relentlessly on use cases” and interdisciplinary is our “secret sauce”
- Ownership of data is a critically important issue – needs to be owned by the people
- How should Metro21 define itself in terms of the challenges of the whole region? Bring together stakeholders from rural areas as well.
- Infrastructure – challenge is gathering accurate and meaningful data
David Roger

President, Hillman Family Foundations

- Traffic light at Forbes and Morewood --> "I wonder if this technology can help me get home faster."
  - Henry Hillman
- Traffic21 was the test model for us. We can take on big challenges we can marshall resources, we can work with the city, and we can work with the county to solve big problems.
- You need to iterate and follow the opportunity. Traffic21 --> Metro21
- Different groups have different ways of looking at problems (academics, elected officials, etc.). When you combine skill sets, you can achieve great things.
Key Points

• What is the science of smart cities: The data science of smart cities and collaboration

• Don't look at a particular point of a city, or a series of individual points in a city, seek to understand the city globally across space and time.

• Edge computing could help you create a nervous system - sense, process, and intelligently react to phenomena as they occur.

• We need to understand the causality. There are a lot of counterfactuals that people running cities need to solve. Computer science and predictive analytics can help people model these and make decisions accordingly.

• Cities are actually highly constrained and predictable systems. The difficulty isn't in modeling them in that sense, it's in modeling the complexity. We should be able to model and optimize cities.

• Cautions about smart cities --> responsibility and culpability. Who is responsible when something goes wrong? These systems need to be interpretable and transparent with laws to allow for ways to contest algorithmic decisions or at least a right to an explanation.
Key Points

• The City of Pgh evaluates opportunities first from the business end and Port Authority needs to do what it does well to become the most attractive place for transportation.
• Data infrastructure, cloud computing, and application development are the three pillars of smart cities development
• Public-private partnerships as one of the key ways to move projects forward, but funding models have to be adaptive to the city exploring these solutions.
• We'll need an update to the regulatory model to attract the capital.
• There are many challenges with open and iterative data infrastructure for future implementations, analytics from sensors, data reciprocity with private transportation companies, and the difficulty of deploying wireless broadband.
• Public entities can save significant tax dollars by standardizing data formats, and Jim Young calls for thoughtfulness around the security of emerging technologies and devices.
Favorite Quotes

- “Cities are the proving grounds of society” – Grant Oliphant
- “Make sure we’re at the epicenter of making (technology) work for the many, not just for the few” – Grant Oliphant
- “The greatest idea in the world will not take root if it’s not funded by somebody.” – Raj Rajkumar
- “Metro21 is taking it out of the lab and into the streets.” Laurie Weingart
- “My dream is a Minority Report for Infrastructure.” Jim Garrett
- “To produce good learning outcomes - we need to incorporate local knowledge and feedback.” Richard Scheines
- “Krishnan and Jim showed me what Metro21 was doing to address society's greatest challenges.” Andrew Moore
“How do we think about equity when we think about smart cities? Crucial question.” Ramayya Krishnan

“What is the city, but the people?” Don Carter and Shakespeare

“You know when Denmark is coming to you to learn how you're using data to improve your child welfare system, you're doing something right...The solution is to learn from our problems, not perpetuate them.” Alex Chouldechova

“A city is the machinery that is determining everything... it’s an amazing, defined process.” Manuela Veloso

“Whatever we are doing in a city with data analysis, machine learning, or AI, it needs to improve the lives of citizens. We can’t build black boxes that are inaccessible to citizens.” - José Moura
Favorite Quotes

• “Smart cities are interesting because they put computer science ideas into practice.” Satya
• “We work in silos and we may not always understand. We need to cross-educate so we understand.” – Kristen Kurland
• “We have to be very cautious about the investments we make in the city to get the maximum benefit from tax dollars for citizens.” Lee Haller
• “Connective tissue to power the infrastructure. The stuff that you don't see.” Jim Young
• “Transit at its best is something you don't notice.” Katharine Eagen Kelleman
• “We'll need an update to the regulatory model to attract the capital.” Richard Riazzi
• “Our goal is to improve the quality of life for citizens in communities in which we work.” - Frank Sgambati
Summary

• The Metro21: Smart Cities Institute will leverage innovations in technology, policy and their interplay to have a positive impact on metropolitan societies.

• Metro21 aims to solve real-world problems assisted by an intellectual core of scholarship, education and expanding knowledge.

• Metro21 seeks to develop a science of smart cities.

• Metro21 will work closely with government, private sector and non-profit partners.
We invite you to join us to make our cities much better places to live in.
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