

# DeepTech: The Internet of Things, Connected Vehicles, and How (Secure) Location Builds a Smarter Future

Josh Siegel, Ph.D.

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# Talk agenda

- **My personal background and defining Deep Technology**
  - **Introduction to the Internet of Things (IoT) and its enabling capabilities**
  - **Contemporary IoT application areas**
  - **Introduction to Connected Vehicles (as a subset of the Internet of Things)**
  - **Contemporary Connected Vehicle Applications**
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- **The need for (secure) location data in making DeepTech mainstream and increasingly impactful**



# Who am I, and what experience do I bring to this talk?

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# My academic work focus on IoT, sensing, and vehicle automation



Josh Siegel



## Assistant Professor, Michigan State CSE

Courtesy appointment, ECE

– Research:

- **Ubiquitous Connectivity** – secure, resource-efficient, and scalable IoT using contextual AI
- **Pervasive Sensing and Universal Diagnostics** – making “data exhaust” actionable for vehicles, appliances, and health
- **Enhanced (Self-)Driving** – using AI and connectivity to create safer defensive driving algorithms and resilient vehicles

– Teaching:

- **Advanced Topics in Automated Vehicles (CSE/ECE/ME)**
- **Introduction to (Entrepreneurship and) the Internet of Things**



## Lead Instructor, MIT “DeepTech” and “IoT” Bootcamps



## Short-Term Lecturer, MIT Sloan “Implementing Industry 4.0”



## Former Research Scientist, MIT

– S.B., S.M., Ph.D. from MIT Mechanical Engineering





# I also have entrepreneurial and corporate expertise



Josh with the “Carduino” device



## Co-Founder, Course Zero Automation

- Inertial navigation units for GPS-deprived soldiers



## Founder, CarKnow

- Connected car hardware/software platform



## Founder, DataDriven

- Vehicle “diagnostics as a service” platform

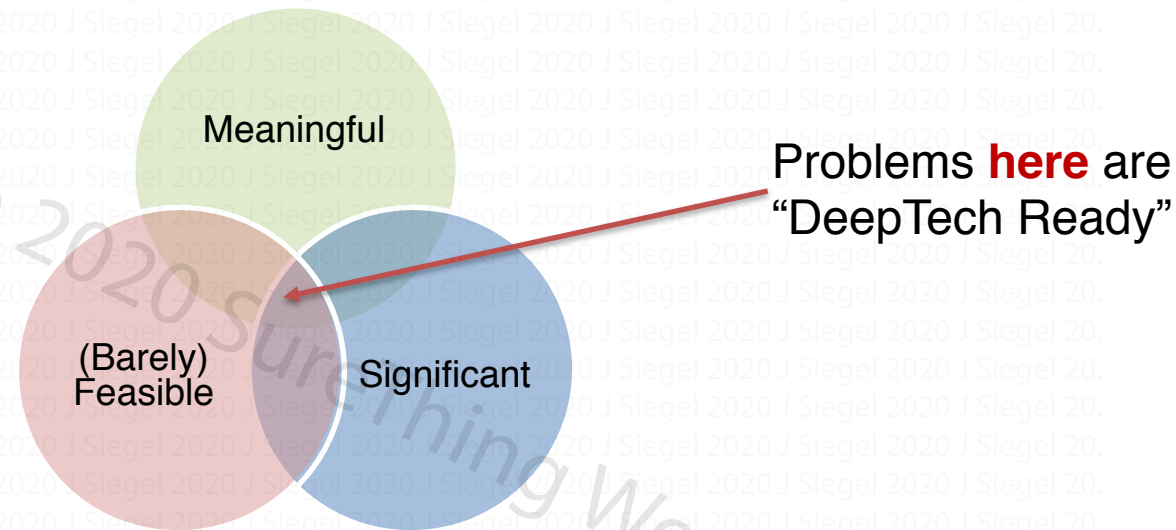
## Consultant and Expert Witness

- Work with public companies to provide business and tech expertise
- Focus on new business models and technology roadmaps

## E-CLVB Former President, MIT Entrepreneurs Club



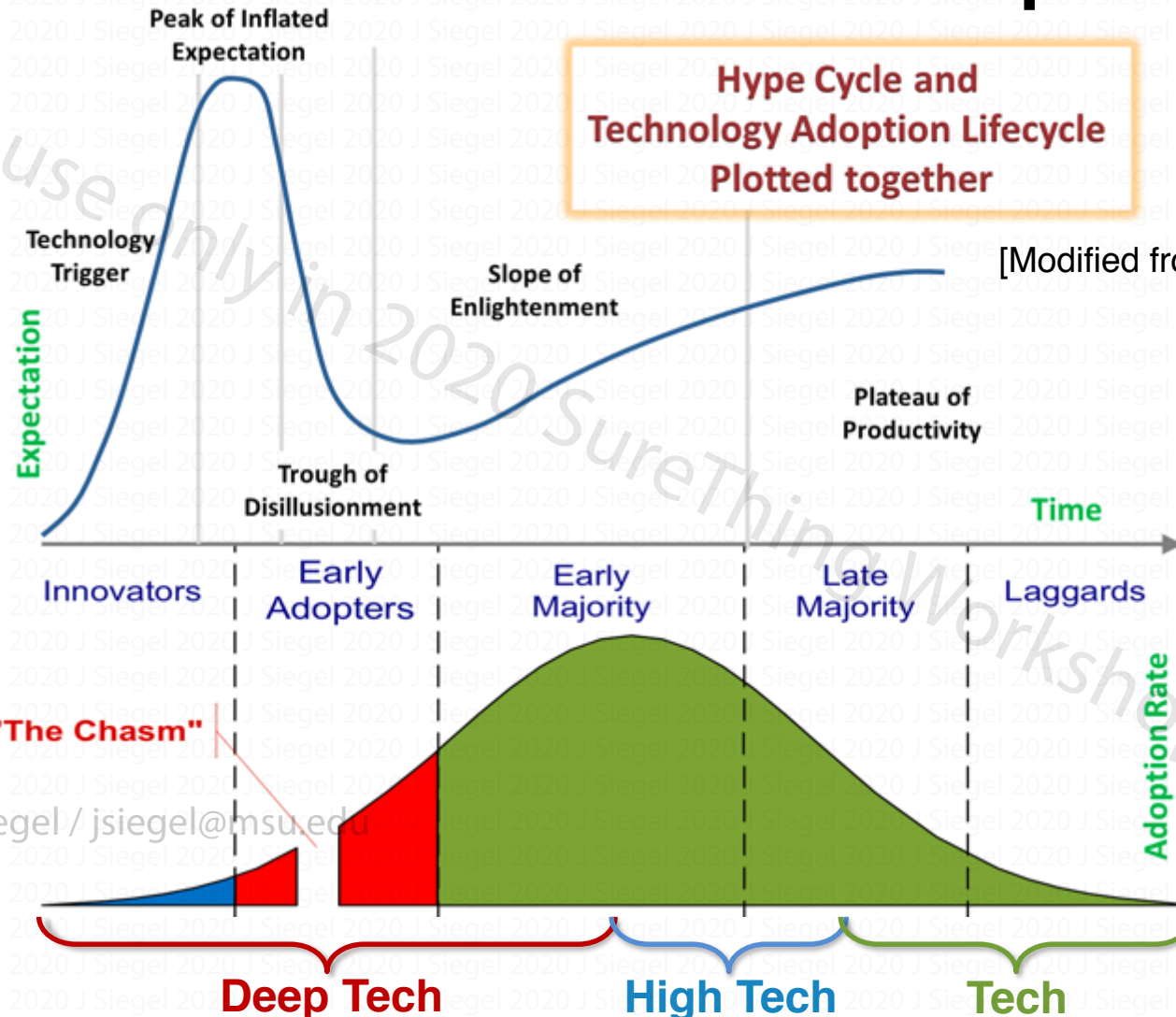
# At MSU, I combine these backgrounds in running the **DeepTech Lab**



**DeepTech addresses *real and significant problems* using technology that *was impossible yesterday, is barely feasible today, and tomorrow has the potential to become a pervasive and invisible basic need***



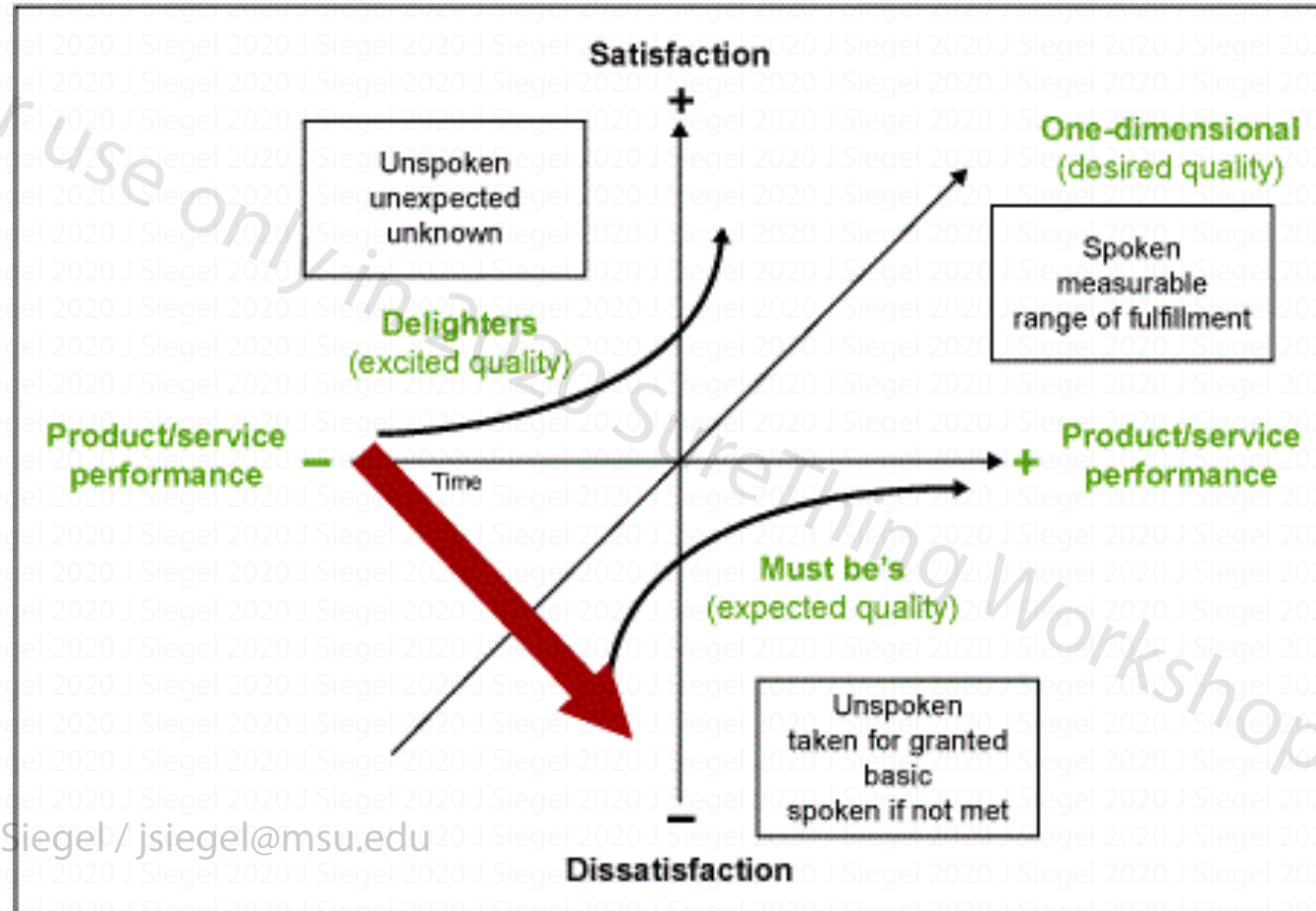
# DeepTech shouldn't remain 'deep' forever



Deep Tech adoption starts slowly because it's specialized and difficult to implement  
As skills grow and tools support its implementation, Deep Tech becomes High Tech and eventually just tech



# DeepTech diffuses towards basic need via the Kano Model



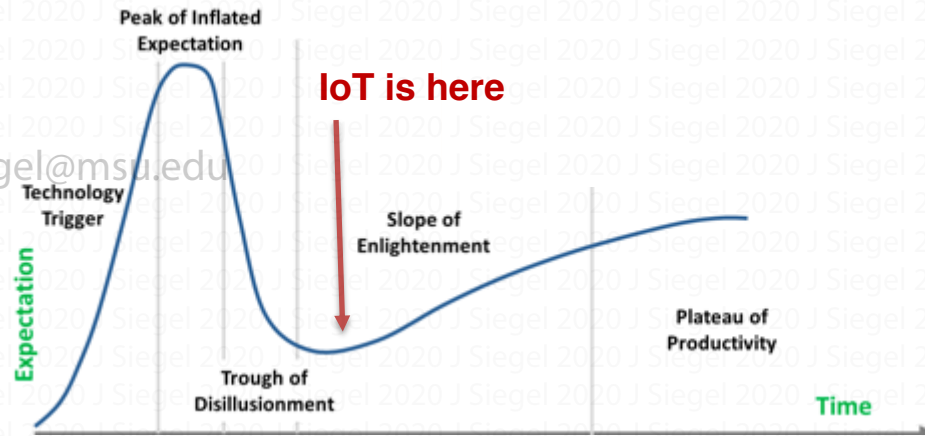
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**Today, we look at two Deep Technologies –  
the Internet of Things and Connected Vehicles –  
at different points in this model**





# The Internet of Things (IoT) is Deep Technology fast approaching the “slope of enlightenment”



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# Everyone defines IoT differently

- “Computers sensing things for themselves” – *Kevin Ashton*
- “The Internet of Things makes the physical world amenable to computation.” – *Ravi Pappu*
- “IoT is a set of technology principles, architectures, and concepts with which you can do magic. It's a way to question why switches need wires to bulbs.” – *Sanjay Sarma*
- “The IoT is a science primarily focusing on creating the most complex ways of turning lights on.” – *Dom Guinard* (Sanjay's former student)

**Today, we will locally re-define the Internet of Things**



More information at:  
<http://jsiegel.msu.domains/>

Material for use only in 2020 SureThing Workshop

