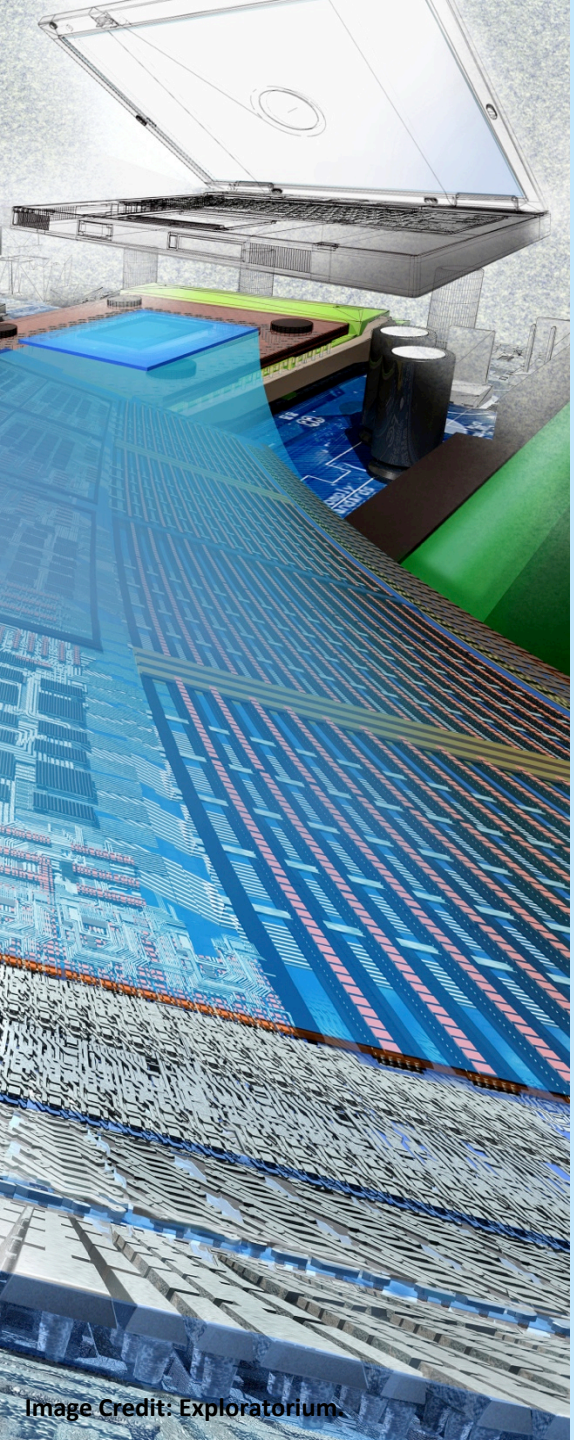
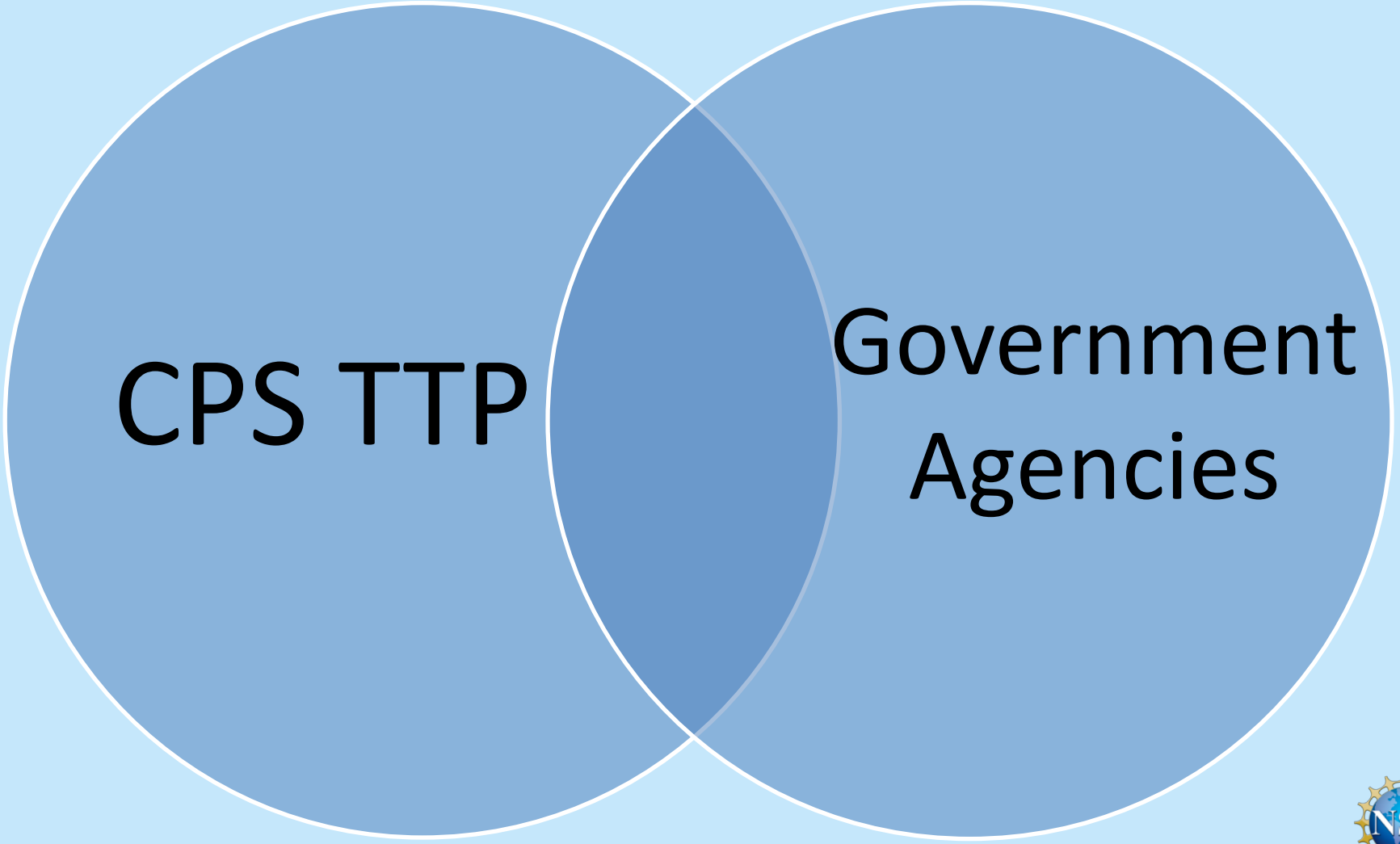


Image Credit: Exploratorium

Transition to Practice

2018 NSF CYBER-PHYSICAL SYSTEMS PRINCIPAL INVESTIGATORS' MEETING

CPS has a passion in developing foundational research with the potential for maturation in industry or for other customers

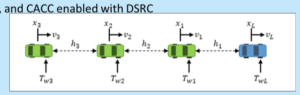


Panel I: Getting and Running a TTP Award
Moderator: Sylvia Spengler

Traffic Operating System for Smart Cities
TTP demo: platoons at intersections

Murat Arcak (University of California-Berkeley), Award # 1545116

- Dramatically increase intersection capacity (at least x2) by maintaining small space gap during acceleration from rest at green light
- Demonstration in real traffic in Arcadia, CA
- Study throughput/safety/comfort tradeoffs prior to experiments
- MPC controller to manage the tradeoffs
- Vehicles with camera, radar, GPS, and CACC enabled with DSRC
- 1 leader, 3 follower vehicles:

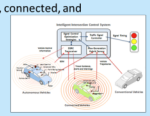


- *V2V communication:*
  - Predecessor following + leader topology
  - Position, acceleration, planned velocity shared
  - Delays modeled, accounted for by controller

CPS: TTP Option: Synergy: Traffic Signal Control With Connected And Autonomous Vehicles In The Traffic Stream

Lily-Ageliki Elefteriadou (University of Florida), Award # 1446813

Developing signal control optimization strategies for autonomous, connected, and conventional vehicles
Funding from NSF ($1.3M) and FDOT ($392K)
Developing simulation environment (VISSIM)
Timeframe: 3 years completed/ 4 years total
Planned testbed in Gainesville/UF campus for testing

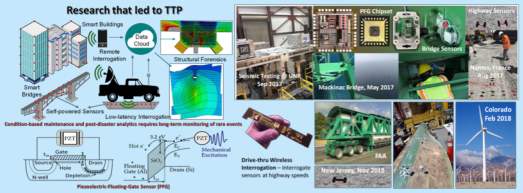


- Transition to Practice: Initial Testing:
- Initial testing in Gainesville and TERL in Tallahassee
- DSRC communication
- Completed fusion for radar & DSRC, now adding video
- Requires FDOT permit for on-street implementation

UF Transportation Institute UNIVERSITY of FLORIDA

CPS: TTP Option: Collaborative Research: Internet of self-powered sensors - Towards a scalable long-term condition-based monitoring of civil infrastructure

Nizar Lajnef (Michigan State University), Award # 1645783



CPS: TTP Option: Synergy: Collaborative Research: Nested Control of Assistive Robots through Human Intent Inference

Deniz Erdogmus (Northeastern University), Award # 1544895

- The Human-in-the-loop cyber-physical systems (HILCPS) hardware-software co-design and automatic synthesis infrastructure.
- They developed prosthetic and wearable hands controlled via nested control that is robust to uncertainty in human intent inference from physiological signals.

Panel II: Federal Perspective on Technology Maturation
Moderator: David Corman, NSF

EXPLORATORY ADVANCED **RESEARCH**

Highway Network Efficiency

Presentation at the NSF CPS PI Meeting
November 16, 2018
David Kuehn, FHWA

US Department of Transportation Federal Highway Administration

USAID

Brent Wells
AAAS Fellow
Advisor, SS Africa

Partnerships for Enhanced Engagement in Research (PEER)

TTP
TRANSITION TO PRACTICE

PROGRAM OVERVIEW

Homeland Security Science and Technology

Nov 16, 2018
@DHSSciTech #TTPTech

Secure and Trustworthy Computing:
Transition to Practice (*SaTC TPP*)

Dr. Shannon Beck
Computer and Information Science and Engineering (CISE)
16 November 2018

NSF

Panel I: Getting and Running a TTP Award

- Moderator: Sylvia Spengler

Some Questions:

- How did you apply for this?
  - As an added option to a CPS proposal.
- What was the thing that surprised you the most?
  - Logistics that are involved. Didn't know would have to go through the risk management office on campus, insurance issues, etc. Figuring out how to navigate that.
  - Having to deal with all of the data, especially the challenges of sharing with collaborators and making it open source.
  - Training new students on what has happened and bring them up-to-speed. And, attracting good students, since there are lots of options in industry.
- How do you set up the partners?
  - Have them involved from the beginning. Communicate expectations with partners and stakeholders early on.

Panel II: Federal Perspective on Technology Maturation

•When you look at ideas: how do you evaluate whether the idea makes sense as a project. For example, “who cares?”, “what excites you?”

- **DOT :** NO the matchmaking role.
- **USAID:** Every country has their own priorities and needs to pass that.
- **SaTC:** All are paneled and have panelists from both academia and industry on the panel.
- **DHS:** must have an impact on one of the DHS components. Must be research that is closer to becoming reality/practical. A proposal that has an immediate need.

Closing

- Try to push forward technologies that are not quite ready for technology to be interested in it.
- If want to do a TTP, you need to find someone who will be good at leading this part (which may not be you).
- Finding a partner is critical: especially, people who can develop software is often overlooked within research (who can harden it), even a professional programmer.
- Not sector specific, thinking outside of the box.