DRAPER®

Context-Sensitive Adaptive Framework for Cross-Platform Interaction

Pooja Patnaik Bovard, Ph.D.

23 March 2021

NDIA Human Systems Conference 2021

DISTRIBUTION STATEMENT A: Approved for public release

Challenge

Current State of the Art

SOA	Pros	Cons
Simulated environments	Can understand user behavior in mission-specific contexts	Low ecological validity
Suppress notifications when user is engaged in a task	Users are less stressed and more focused on important tasks	Can take attention away from critical information

Our plan	Pros	Cons
Adaptive alerts could focus on prioritized information to make proactive decisions ahead of danger	Reduced cognitive overload when faced with danger	

Use Case

Project Objective: Develop a hands-free, heads-up adaptive ATAK environment prototype that enhances SA and DM for tactical operations

Demonstrate ability to capture and translate relevant voice input in near real-time

HoloLens II mic array

Demonstrate ability to monitor and adapt to changing context within ATAK environment

Local TAK server

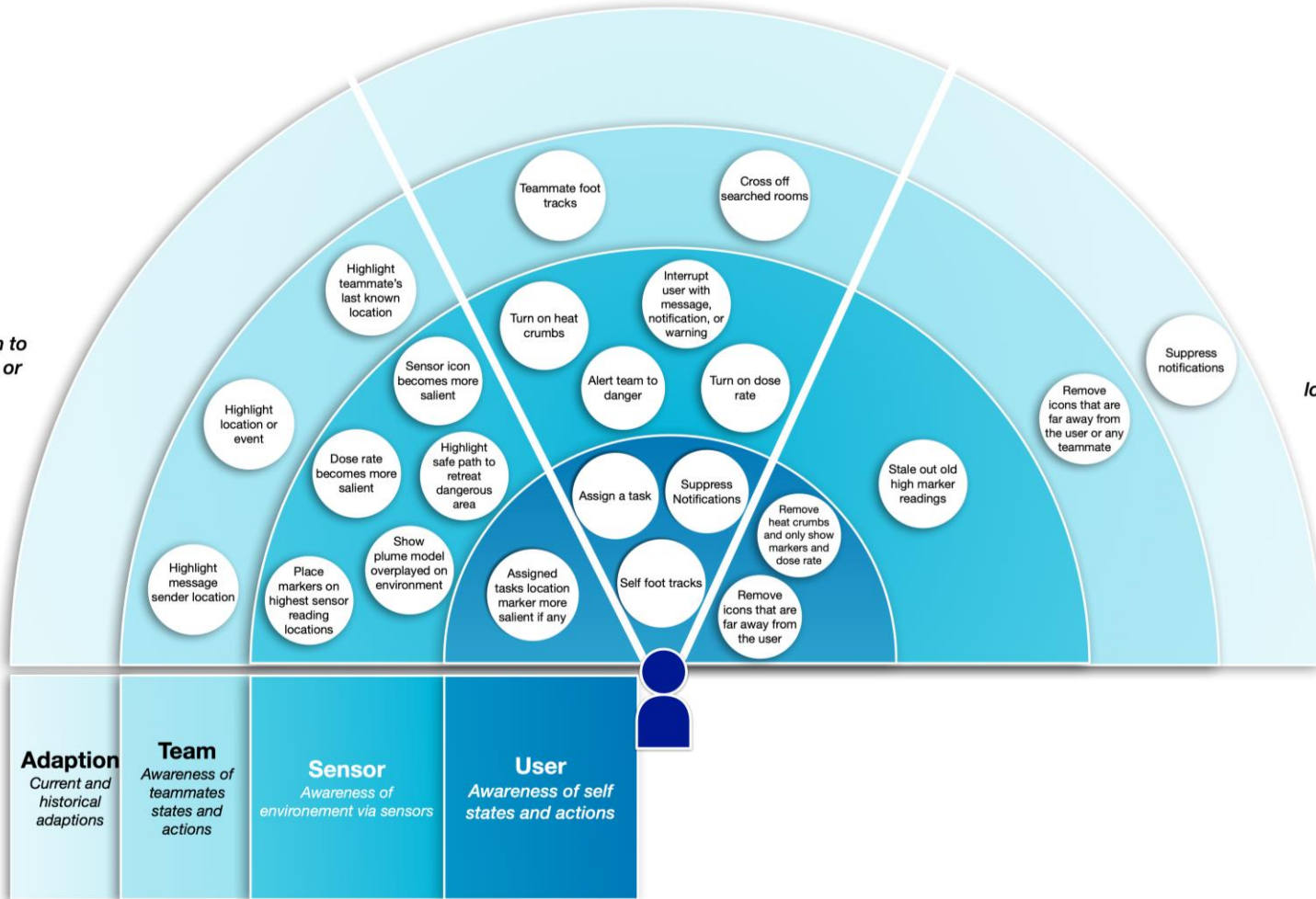*Demonstrate ability to display ATAK content with spatial accuracy*

DRΛPER®

Framework

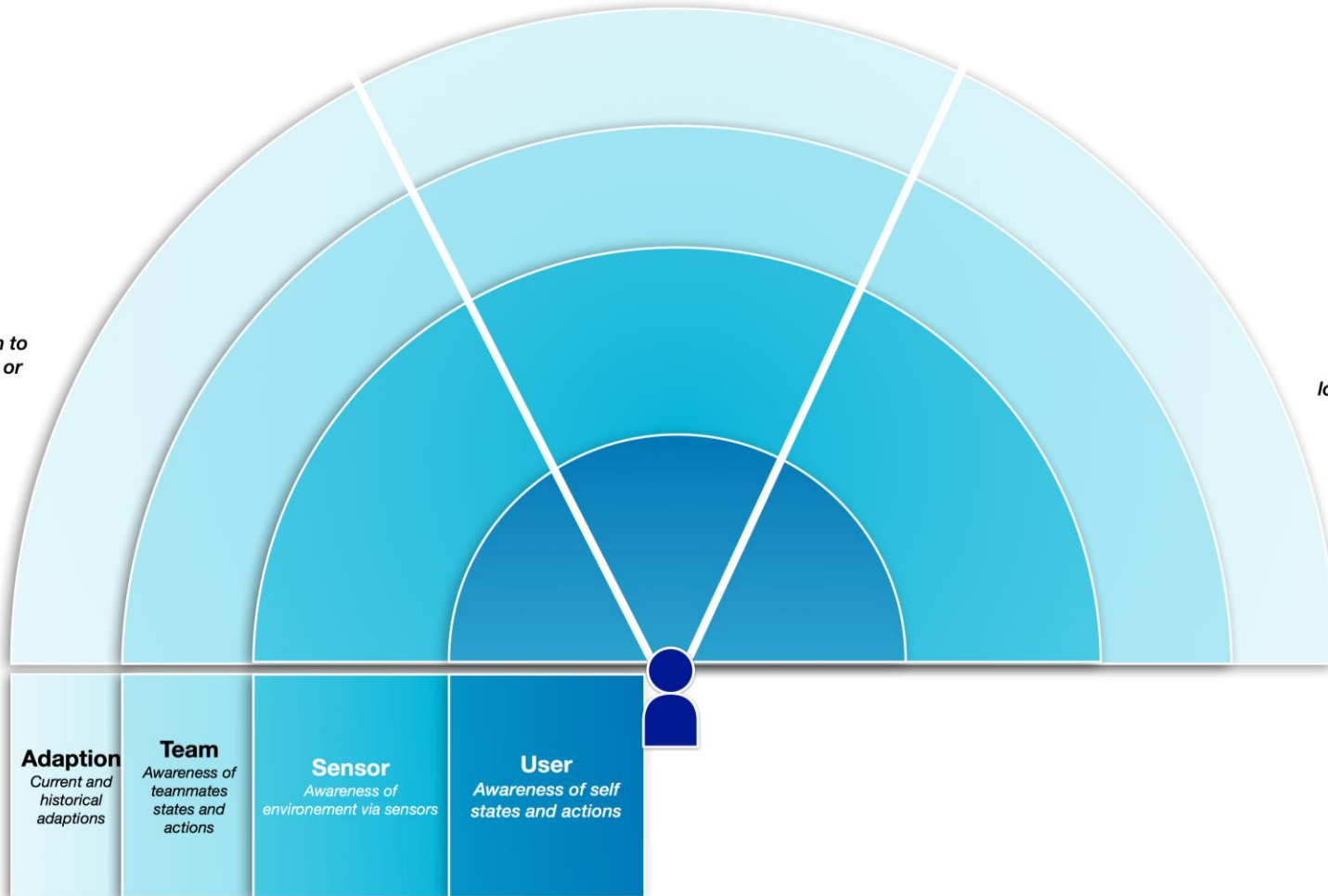# Adaptive Context Framework
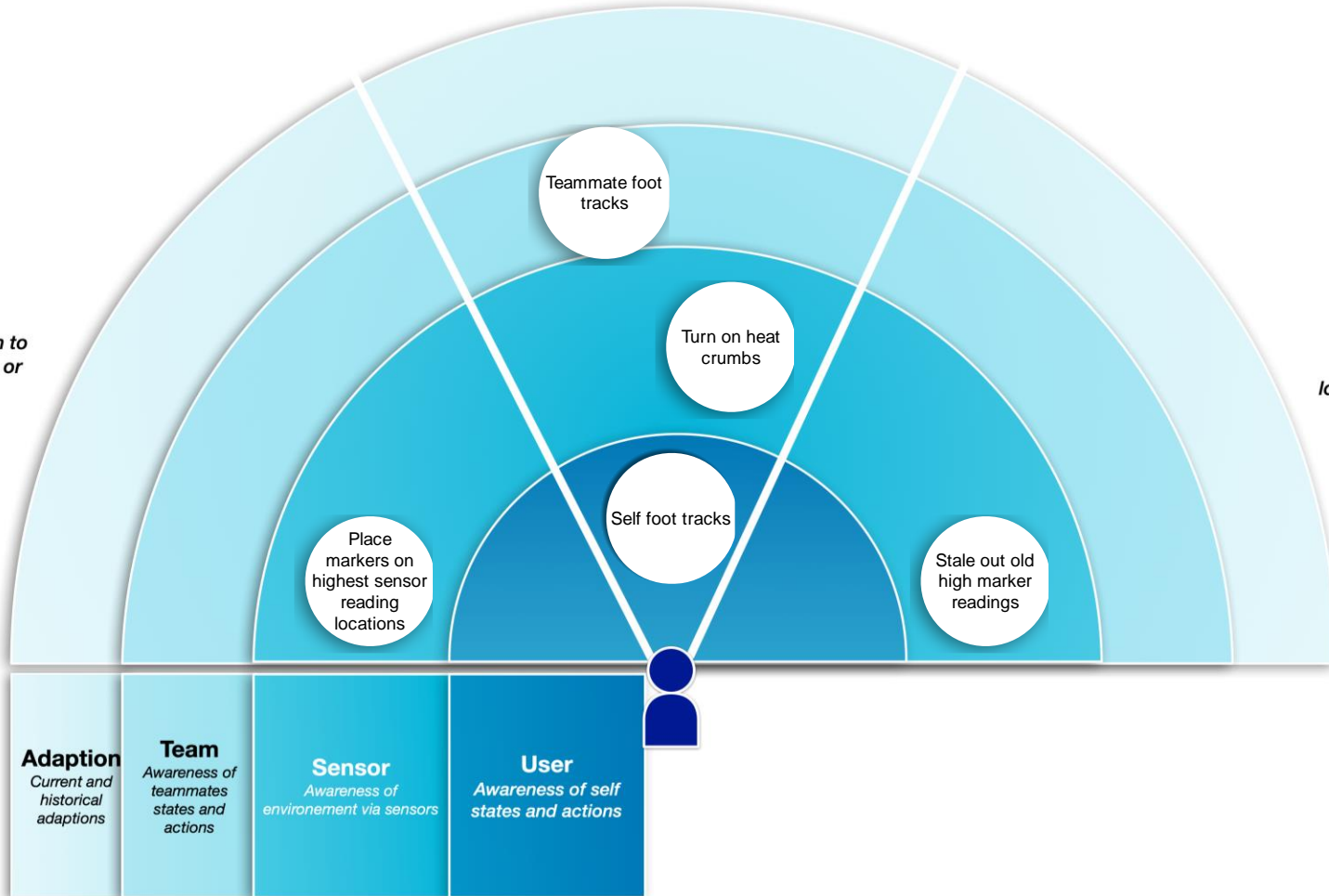

Pacing/Timing
Display the information that makes sense for that specific task at a time when it will be useful

Salience
Draw the user's attention to specific UI components or information
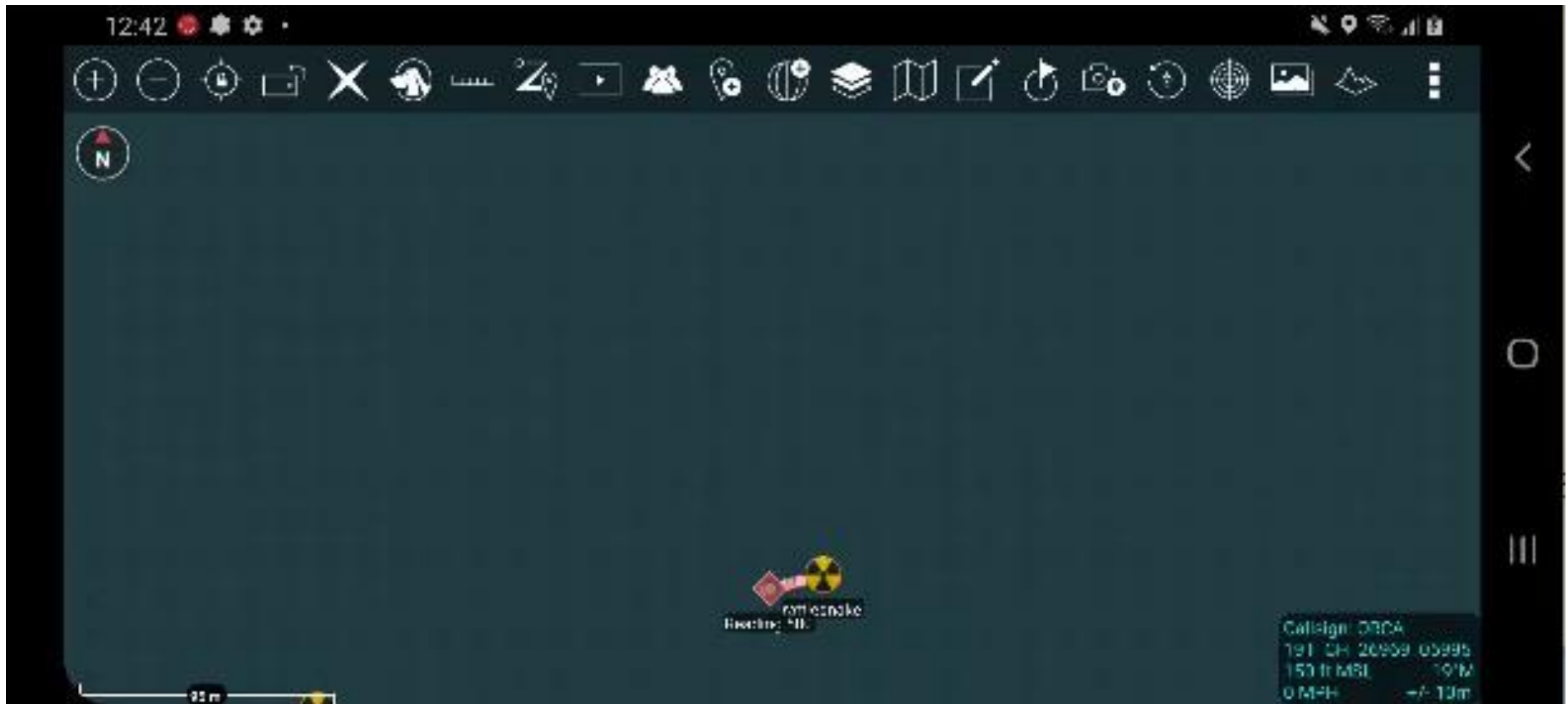
Decluttering
Remove extraneous information that no longer applies to the user

Adaption
Current and historical adaptions

Team
Awareness of teammates states and actions

Sensor
Awareness of environement via sensors

User
Awareness of self states and actions

Context
Data/information important for situation awareness in each of these contexts: what, where, when

6

Adaptive Context Framework

7

Demo

Ongoing & Future Work

- Cross-platform testing and validation
  - In the planning stages

- In-depth testing of more advanced adaptations
  - How much can an adaptation help users?

- In-depth testing of more advanced contextual inputs
  - What does the framework look like when we involve multiple contexts?

DRAPER ®

Contact:
Dr. Pooja Bovard
617-372-6260
ppatnaik@draper.com

Contributors:
- Rachel Champoux
- Dr. Kelly Hale
- Emily Weeden
- Eric Collins
- Alex Hamme

Questions?

DRAPER®