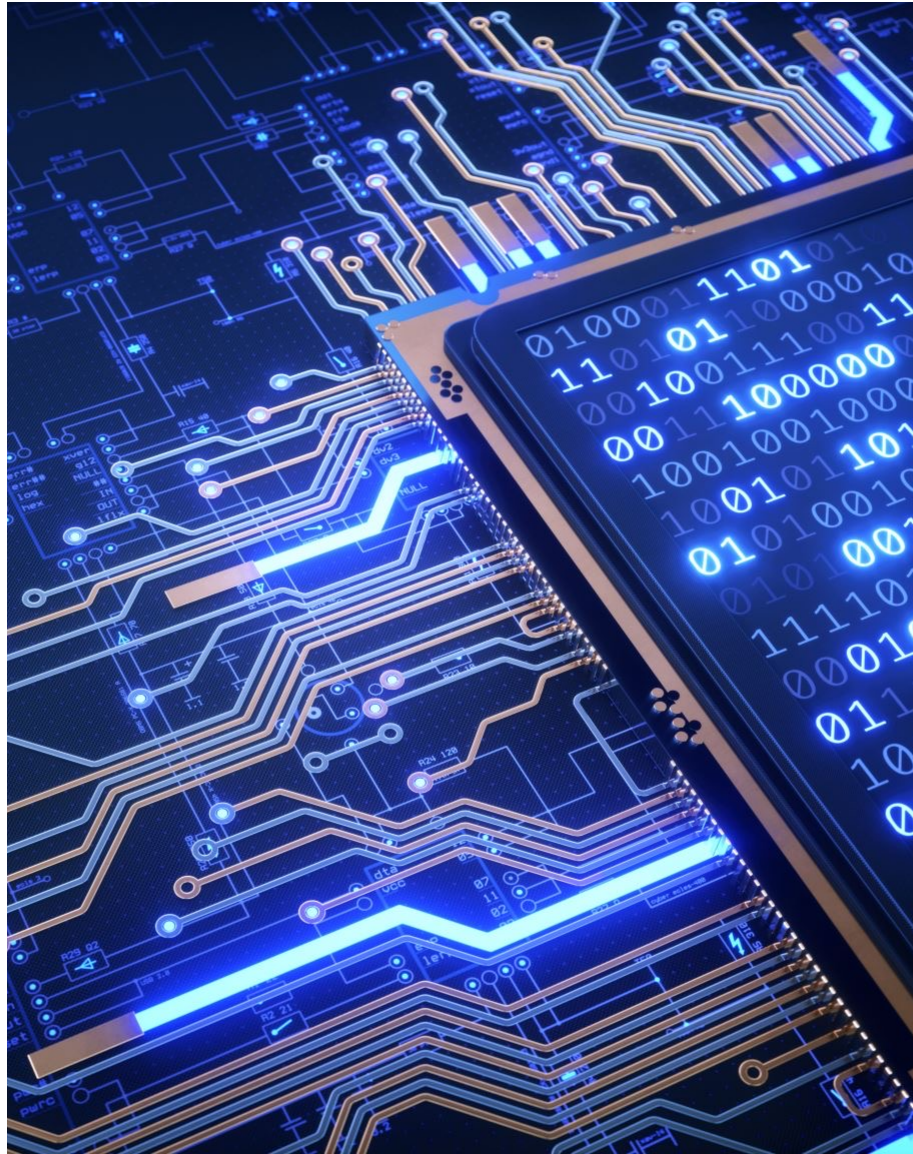




A Behavioral
Science
Perspective to
Social Analytics

David Matsumoto, Ph.D.
Humintell



Outline

- Behavioral Science Frameworks for Facial Expressions of Emotion
- Behavioral Science Frameworks for Body Language
- Developing Ontologies and Ground Truth
- How Behavioral and Computer Scientists Work Better Together
- Considerations of Dimensions of Culture when Developing a Situation Awareness System



Behavioral Science Frameworks for Facial Expressions of Emotion

Types of Movements and Signals

- Face Basics
 - Neuropsychology of Facial Behavior
 - Movements vs. Expressions
- Types of Signals in Expressions
 - Basic emotions
 - Other emotional, affective, cognitive, and physical states
 - Behavioral intentions
 - Individual differences
 - Mental and physical health

Theoretical Frameworks

- Evolutionary
 - Basic emotions
 - Ekman, Izard, Plutchik, Fridlund, others
 - Neo basic emotions
 - Keltner, Tracy, Sauter, others
- Constructivist
 - Russell, Feldman Barrett



Behavioral Science Frameworks for Body Language



Different Perspectives

- Neuropsychology
- Mehrabian
 - Immediacy/engagement

Development of the Nonverbal Immediacy Scale (NIS): Measures of Self- and Other-Perceived Nonverbal Immediacy

Virginia P. Richmond, James C. McCroskey, and Aaron D. Johnson

FIGURE 1
Nonverbal Immediacy Scale-Self Report--NIS-S

DIRECTIONS: The following statements describe the ways some people behave while talking with or to others. Please indicate in the space at the left of each item the degree to which you believe the statement applies TO YOU. Please use the following 5-point scale:

1 = Never; 2 = Rarely; 3 = Occasionally; 4 = Often; 5 = Very Often

- | | | |
|-------|-----|--|
| _____ | 1. | I use my hands and arms to gesture while talking to people. |
| _____ | 2. | I touch others on the shoulder or arm while talking to them. |
| _____ | 3. | I use a monotone or dull voice while talking to people. |
| _____ | 4. | I look over or away from others while talking to them. |
| _____ | 5. | I move away from others when they touch me while we are talking. |
| _____ | 6. | I have a relaxed body position when I talk to people. |
| _____ | 7. | I frown while talking to people. |
| _____ | 8. | I avoid eye contact while talking to people. |
| _____ | 9. | I have a tense body position while talking to people. |
| _____ | 10. | I sit close or stand close to people while talking with them. |
| _____ | 11. | My voice is monotonous or dull when I talk to people. |
| _____ | 12. | I use a variety of vocal expressions when I talk to people. |
| _____ | 13. | I gesture when I talk to people. |
| _____ | 14. | I am animated when I talk to people. |
| _____ | 15. | I have a bland facial expression when I talk to people. |
| _____ | 16. | I move closer to people when I talk to them. |
| _____ | 17. | I look directly at people while talking to them. |
| _____ | 18. | I am stiff when I talk to people. |
| _____ | 19. | I have a lot of vocal variety when I talk to people. |
| _____ | 20. | I avoid gesturing while I am talking to people. |
| _____ | 21. | I lean toward people when I talk to them. |
| _____ | 22. | I maintain eye contact with people when I talk to them. |
| _____ | 23. | I try not to sit or stand close to people when I talk with them. |
| _____ | 24. | I lean away from people when I talk to them. |
| _____ | 25. | I smile when I talk to people. |
| _____ | 26. | I avoid touching people when I talk to them. |

Different Perspectives

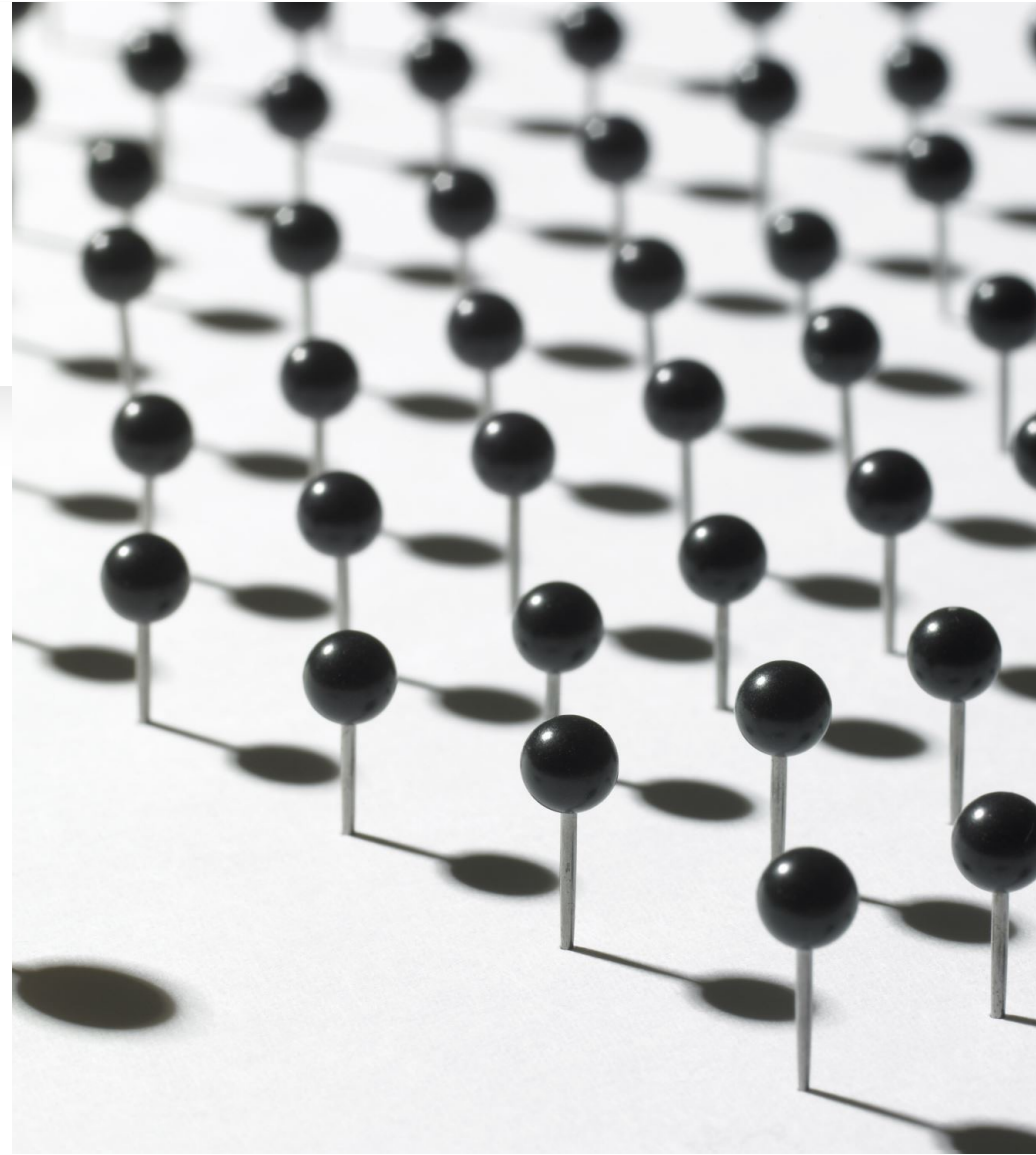
- Rapport
 - Mutual attention, positivity, coordination
- Specific Behavior-Signal Associations
 - Cognitive states
 - Affective states
 - Illustrators
 - Emblems



Developing Ontologies and Ground Truth

Top-Down vs. Bottom-Up

- Top-Down Approaches
 - Impose theoretical or empirical models of behavior on real life behavior
 - Limitations
 - Confusions about associations between signals and movements
 - Real life behavior is messy (signal clarity)





Bottom-Up Approaches

- Sequential microanalysis of specific behaviors of real life behavior
- Limitations
 - Formal vs. informal interactions
 - Rules and behavior much looser in informal interactions



How can Behavioral and
Computer Scientists work Better
Together?



Mutual Respect and Exposure

- Know each other's work better
- Try doing something the other does



—

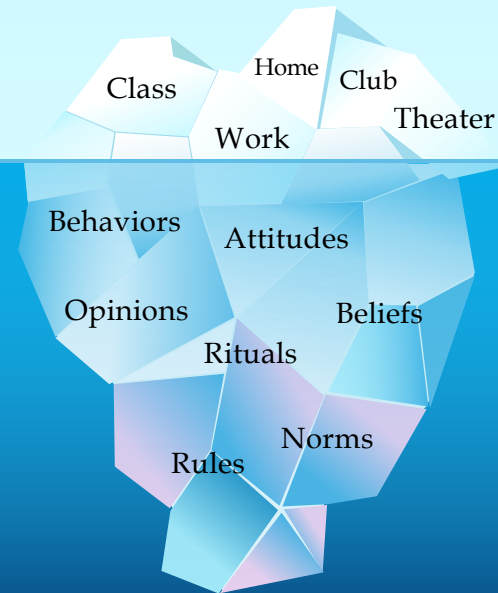
Consideration of Dimensions of Culture when Developing a Situation Awareness System

Well-Known Culture Frameworks

- Hostede
- Schwartz
- Globe

- Problem: Need to translate high level culture to ground level behavior
 - Importance of context

“Context”



“Culture”

**Cultures imbue Contexts with Meaning and Information
that inform Norms**

Matsumoto, D., Juang, L., and Hwang, H. C. (2023). *Culture and psychology*. Cengage.



20th IEEE International Conference
July 15-16, 2024 (collocated with ICME 2024)

Thank you for
your kind
attention!

For a copy of the
slides, please scan the
QR code!



SCAN ME