

Information Design for XR Immersive Environments: Challenges and Opportunities

Elaine M. Raybourn, SNL, emraybo@sandia.gov

William A. Stubblefield, Practical Tales, sfield@acm.org

Michael C. Trumbo, SNL, mctrumb@sandia.gov

Aaron P. Jones, SNL, ajones3@sandia.gov

Jon Whetzel, SNL, jhwhetz@sandia.gov

Nathan Fabian, ndfabia@sandia.gov

HCII Conference July 31, 2019

Pop Culture Influences on Technology



Image Copyright: Paramount Pictures

Pop Culture Influences on Technology



iPad image Copyright Apple



All Star Trek Images Copyright: Paramount Pictures and/or CBS Studios

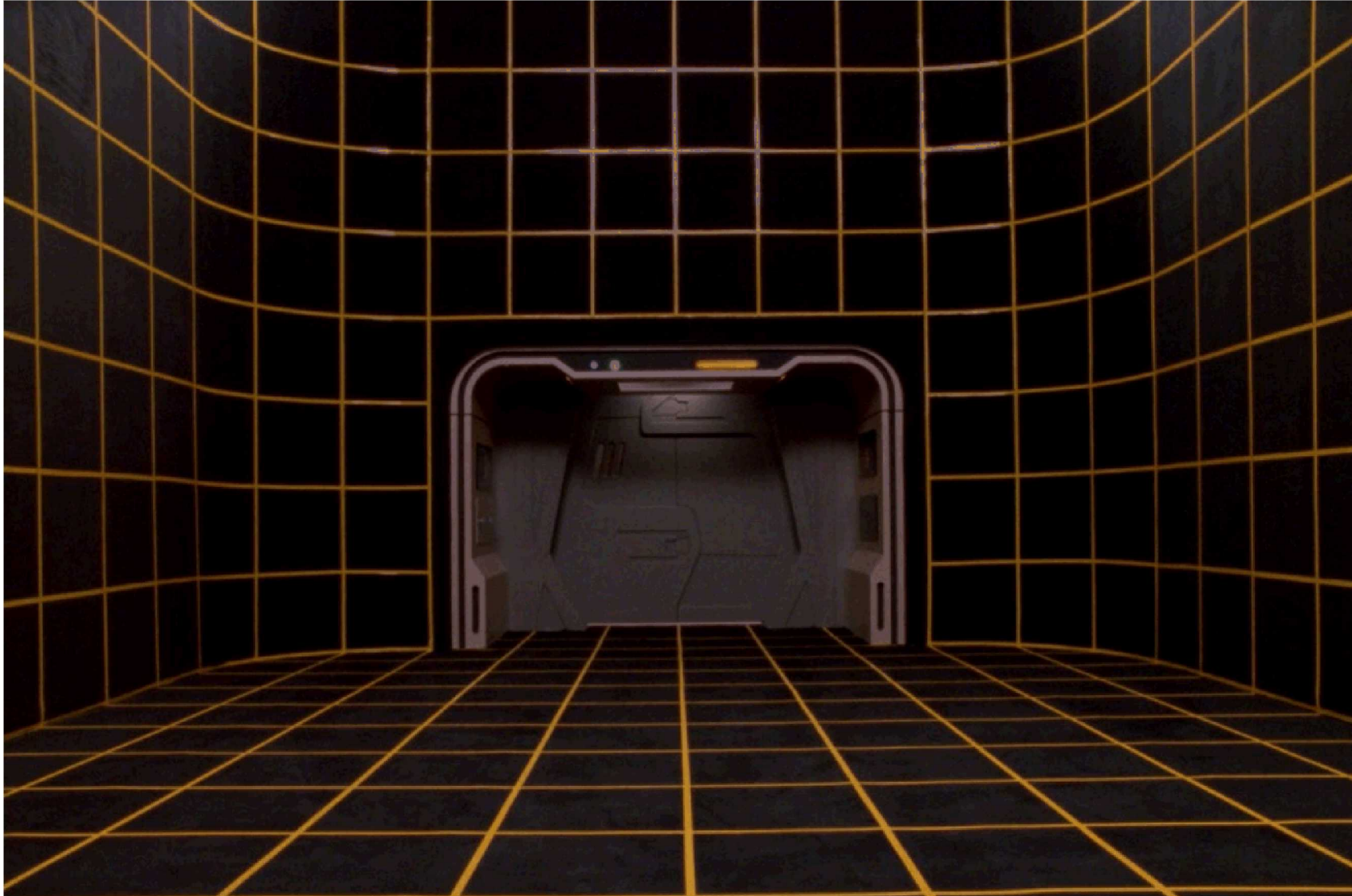


Image courtesy of Martin Cooper

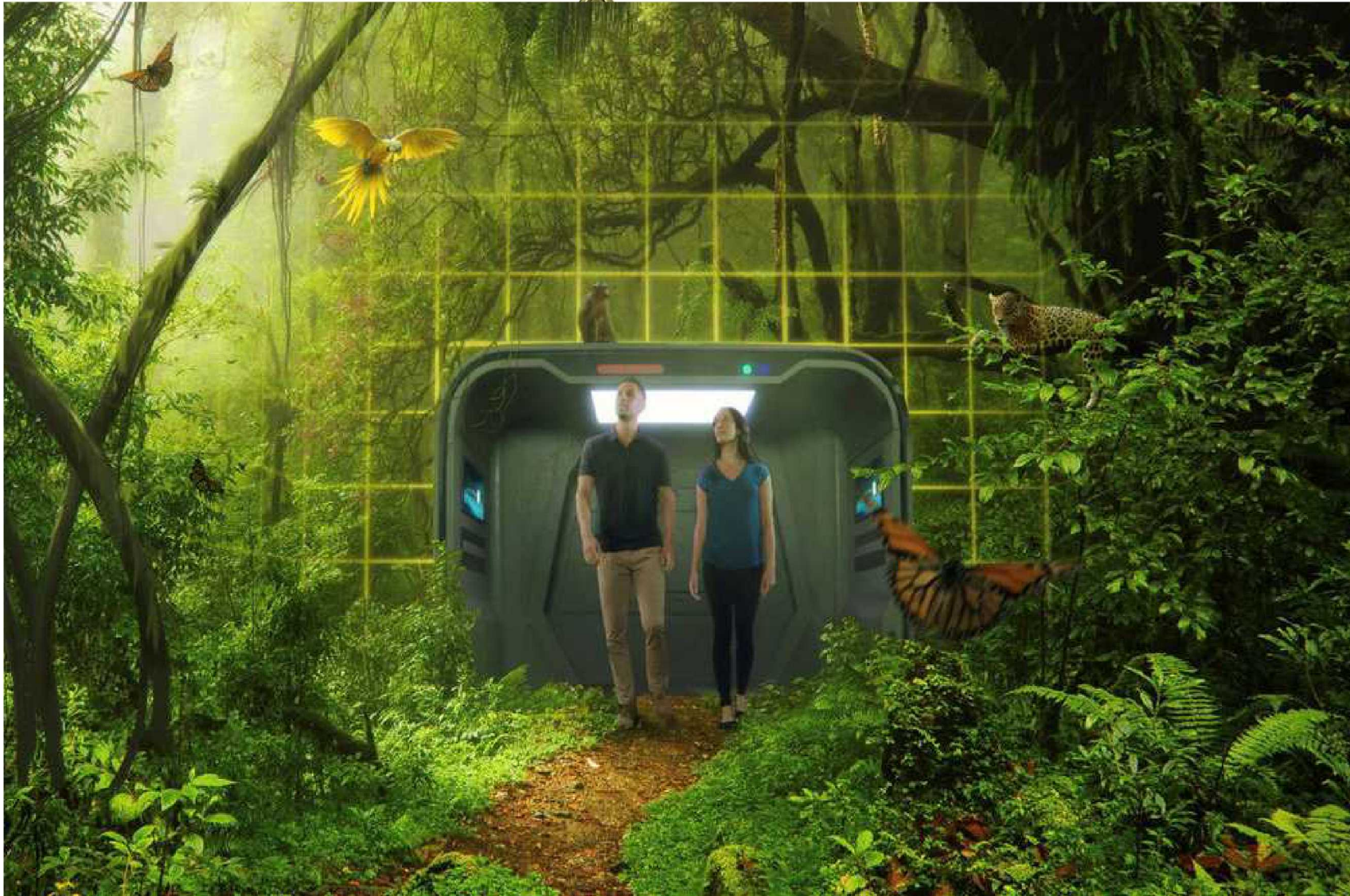
Pop Culture Influences on Technology



Pop Culture Influences on Technology



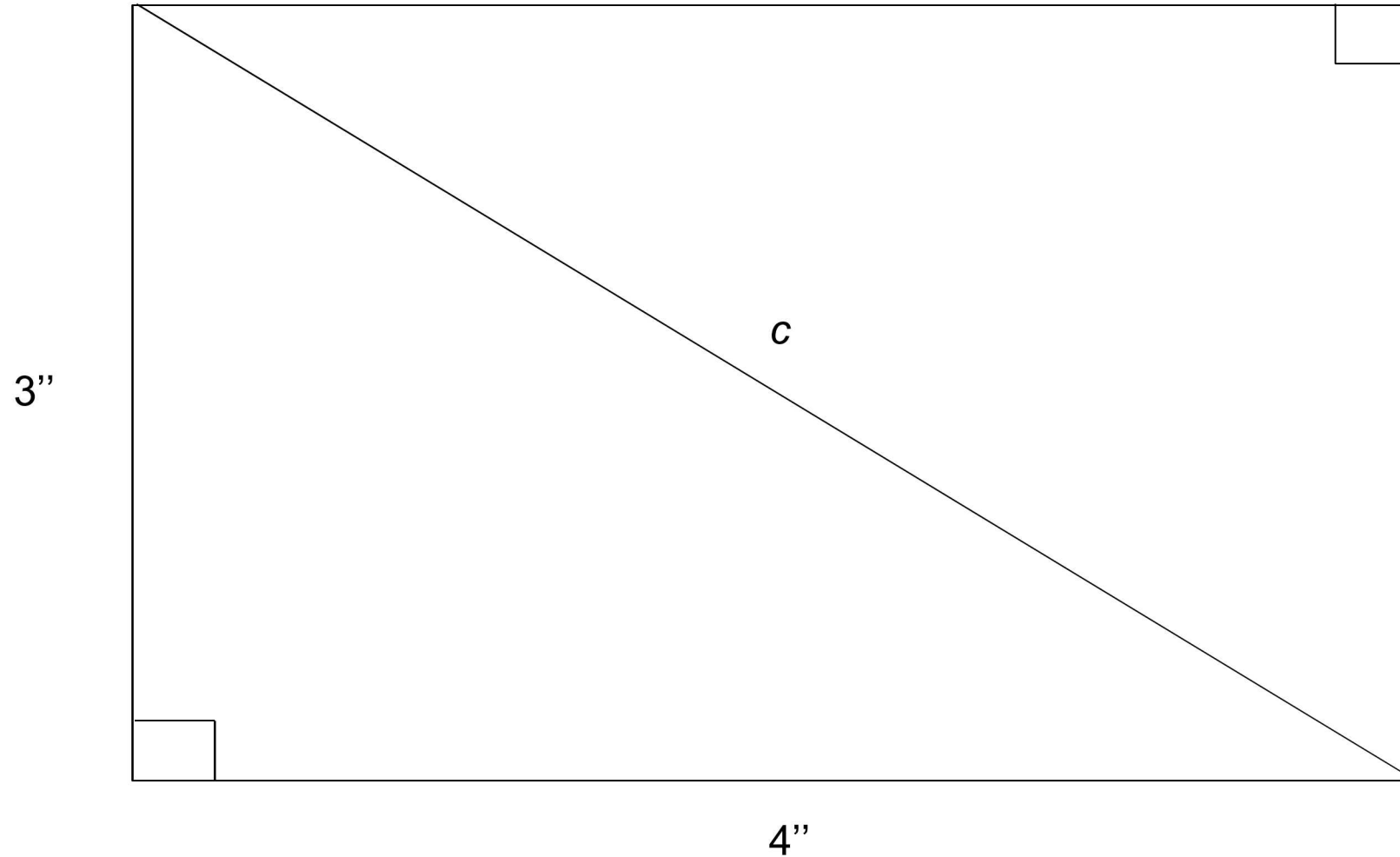
Pop Culture Influences on Technology



Pop Culture Influences on Technology




Presentation matters.



XR creates opportunities

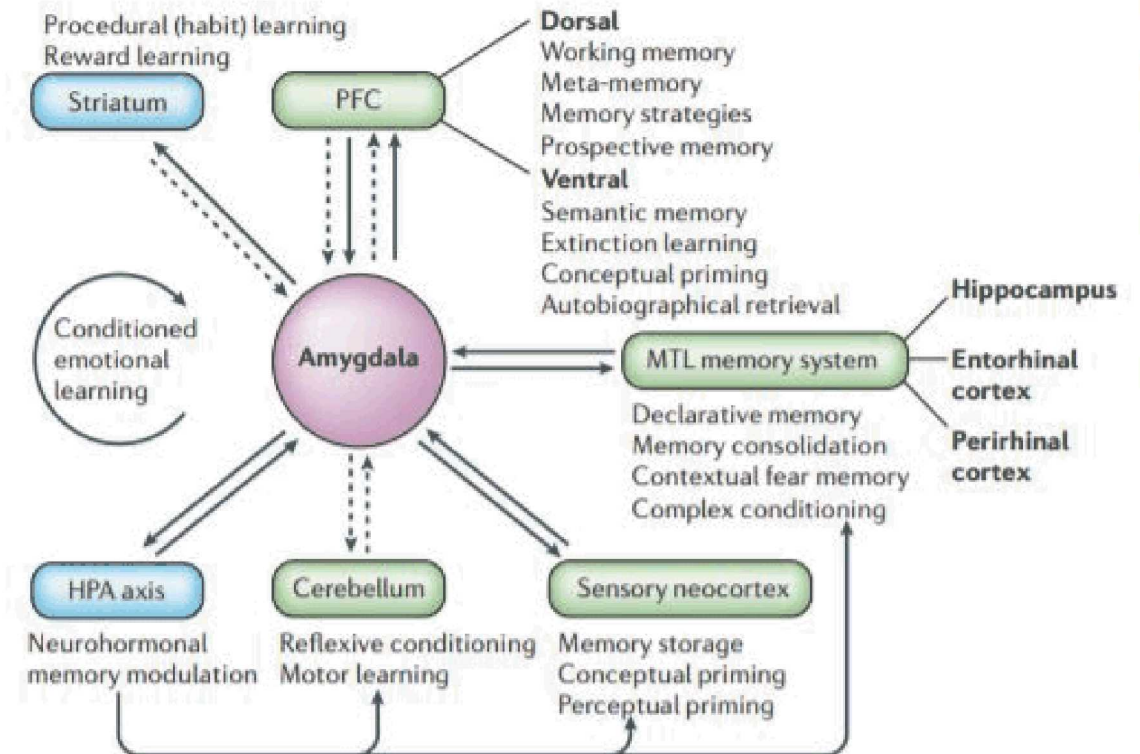
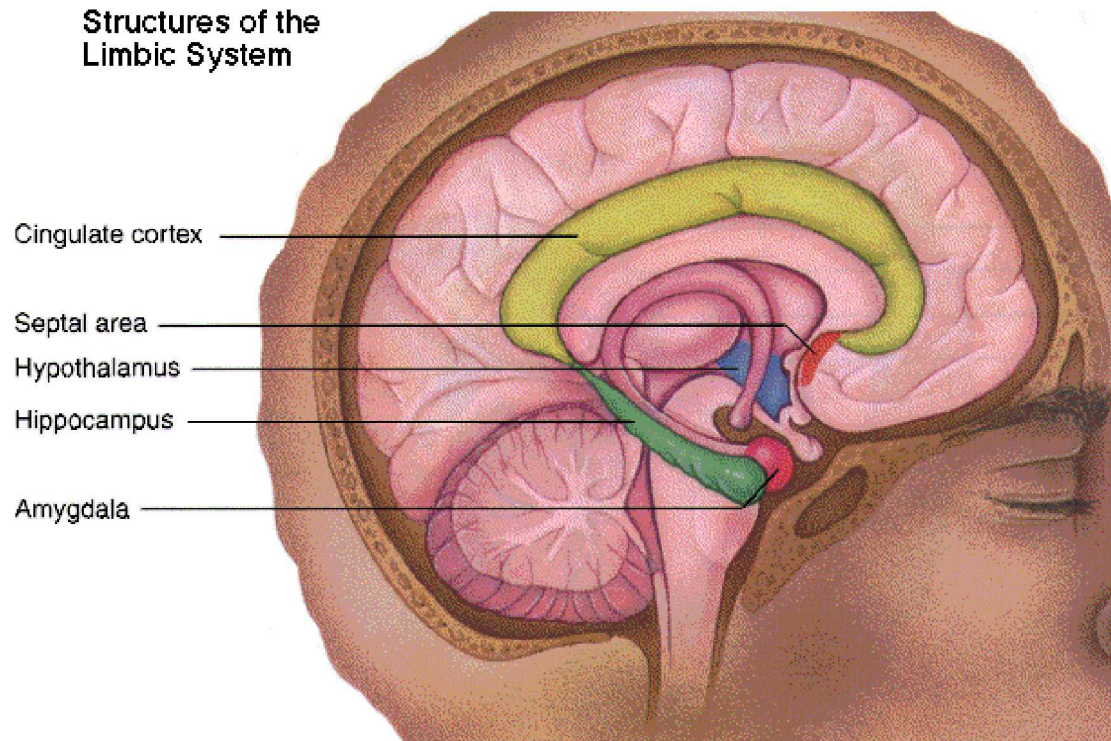




It was not just the pointer to
futuristic technologies of the
holodeck that inspired
audiences around the globe,
but rather the narratives,
or stories, *created in it*.

Why narrative? We are wired for it.

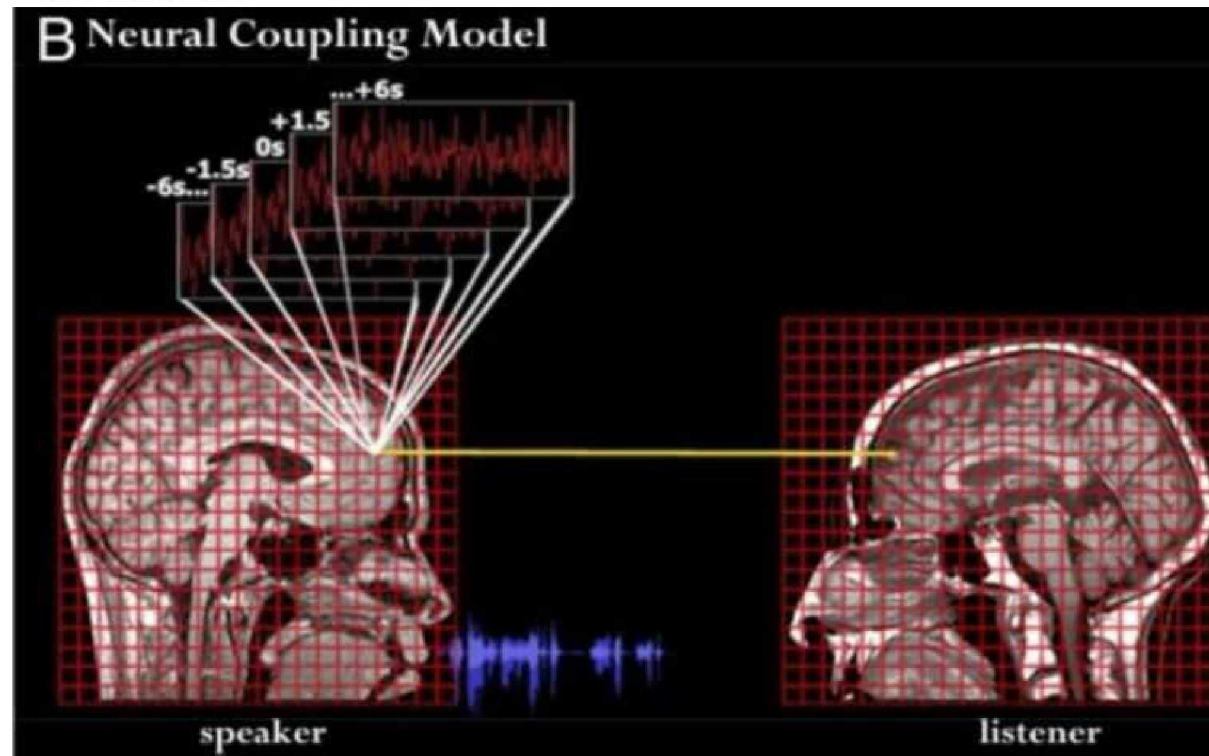
Brown & Benchmark Introductory Psychology Electronic Image Bank copyright © 1995 Times Mirror Higher Education Group, Inc.



LaBar & Cabeza (2006)

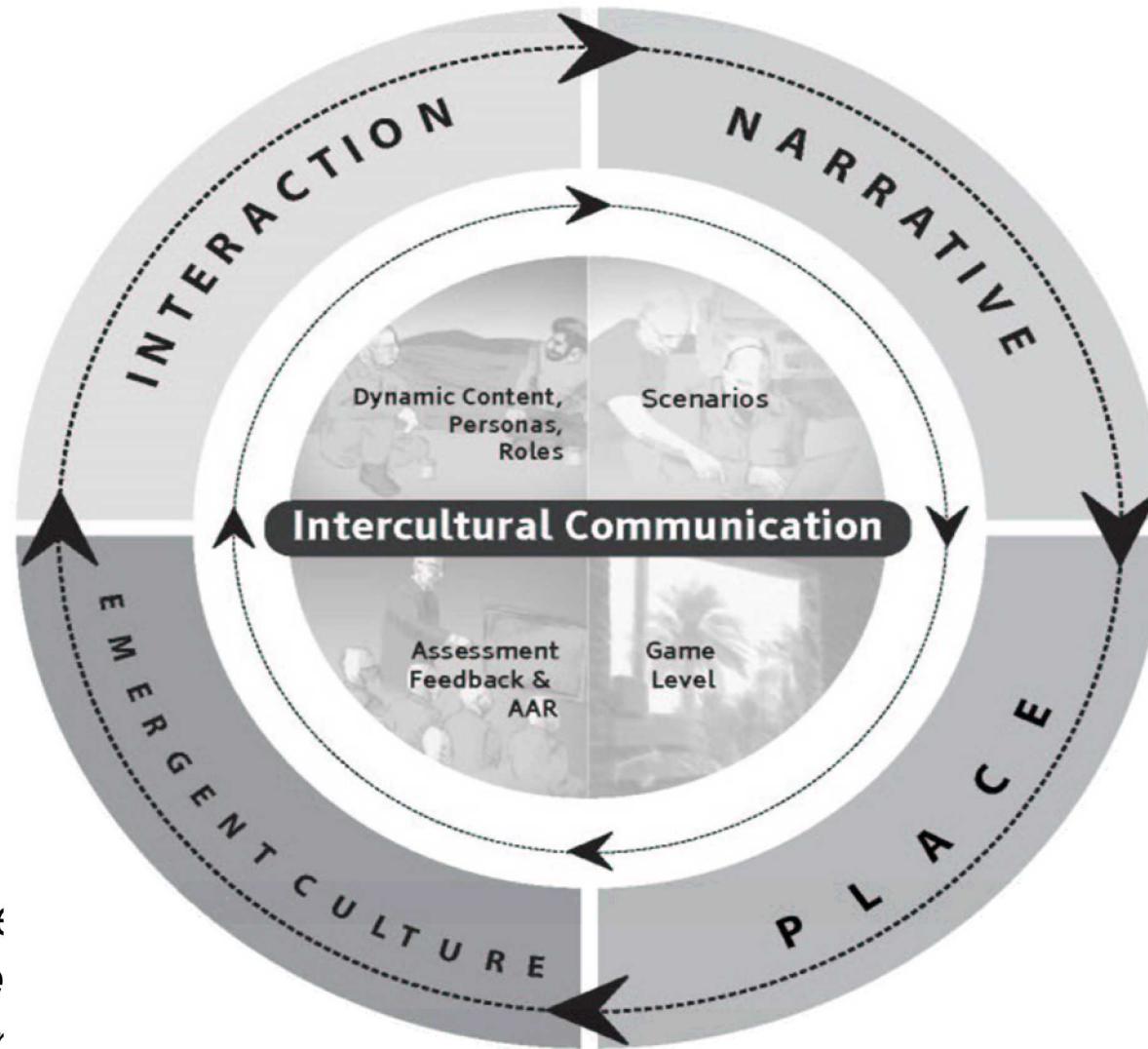
Why narrative? We are wired for it.

- “When the woman spoke English, the volunteers understood her story, and their brains synchronized. When she had activity in her insula, an emotional brain region, the listeners did too. When her frontal cortex lit up, so did theirs. **By simply telling a story, the woman could plant ideas, thoughts and emotions into the listeners’ brains.**”



Stephens, Silbert, & Hasson (2010).

*What is the learner
analysis?*



*What is the core
experience or story?*

*What co-creation
of content
reinforce learning?*

*What is the context, or
experience?*

Simulation Experience Design Framework, Raybourn (2007)

Interaction

The communication space: Support quiet reflection and active immersion

Narrative

The storytelling space: Achieve co-created immersion *with and through* interactivity

Place

The space isn't a place – but it should be a place where people *act*. Achieve immersion with contextual cues

Emergent Culture

The space for diversity: Support multiple points of view and perceptions in multiple spaces



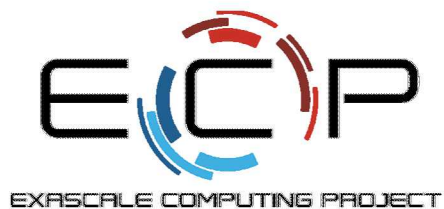
Citation and acknowledgements

Citation

- Requested citation: Raybourn, E. M., Stubblefield, W. A., Trumbo, M., Jones, A., Whetzel, J., & Fabian, N. (2019, July). Information Design for XR Immersive Environments: Challenges and Opportunities. In *International Conference on Human-Computer Interaction*(pp. 153-164). Springer, Cham.

Acknowledgements

- This work was supported by the U.S. Department of Energy Office of Science, Office of Advanced Scientific Computing Research (ASCR), and by the Exascale Computing Project (17-SC-20-SC), a collaborative effort of the U.S. Department of Energy Office of Science and the National Nuclear Security Administration.
- Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA-0003525.



<https://bssw.io> *So your code will see the future.*

Thank you for your participation!

@elaineraybourn

