Multidisciplinary University Research Initiative: Systems for Understanding & Measuring Macrocognition in Teams (SUMMIT)

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Project Vision

- To add, refine, and extend the body of knowledge in the science of collaboration
  - Collaborative problem-solving
  - Macrocognitive processes
- To outline theoretically-based principles of cognition and collaboration in teams
- To develop relevant, valid, reliable, and diagnostic metrics of cognition and collaboration in teams
  - Unobtrusive (some)
  - Triangulate
  - Ease of use
- To create a path for applications, interventions, and demonstrations
  - Net-Centric Warfare

Project Objectives

- To provide a deeper, richer & robust theoretical foundation to macrocognition
- To develop a synthetic task environment to study macrocognition
- To develop, test and improve macrocognative metrics in ill-structured settings
- To increase our understanding of complex collaboration in problem solving setting
- To develop agent models that can replace human team members

Project Research Foci

- **Focus Area 1**: Theory Development
- **Focus Area 2:** Task Environment Development
- **Focus Area 3:** Metrics Development & Refinement
- **Focus Area 4:** Experimentation
- **Focus Area 5:** Agent Modeling
- **Focus Area 6:** Knowledge Management, Sharing & Dissemination

Our Team

- University of Central Florida
  - Department of Psychology
  - Department of Philosophy
  - Department of Industrial Engineering
  - Institute for Simulation & Training
- Scientists
  - **Dr. Eduardo Salas**

    Principal Investigator

Our Team (cont.)

- UCF Scientists (cont.)

Dr. C. Shawn Burke
Industrial/Organizational Psychology

Dr. Stephen Fiore
Cognitive Psychology

Dr. Florian Jentsch
Human Factors and Aeronautical Engineering

Our Team (cont.)

- UCF Scientists (cont.)

Dr. Kimberly Smith-Jentsch
Industrial Psychology

Dr. Randall Shumaker
Computer Science & Engineering

Dr. Valerie Sims
Cognitive Psychology & Human Development

Dr. Denise Nicholson
Optical Sciences

Our Team (cont.)

- Arizona State University

Dr. Nancy Cooke

Cognitive Psychology

Our Team (cont.)

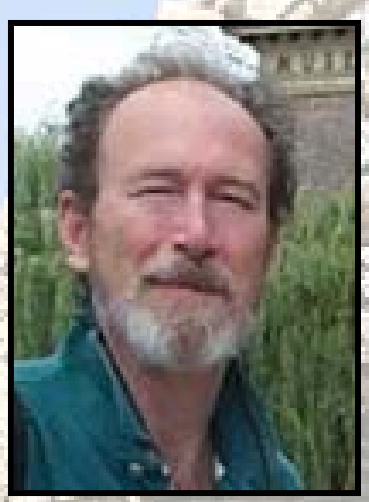
- University of Illinois Urbana-Champaign

Dr. Alex Kirlik

Industrial & Systems Engineering

Our Team (cont.)

- University of Pittsburgh



Dr. Michal Lewis

Engineering Psychology

Dr. Katia Sycara

Computer Science & Applied Math

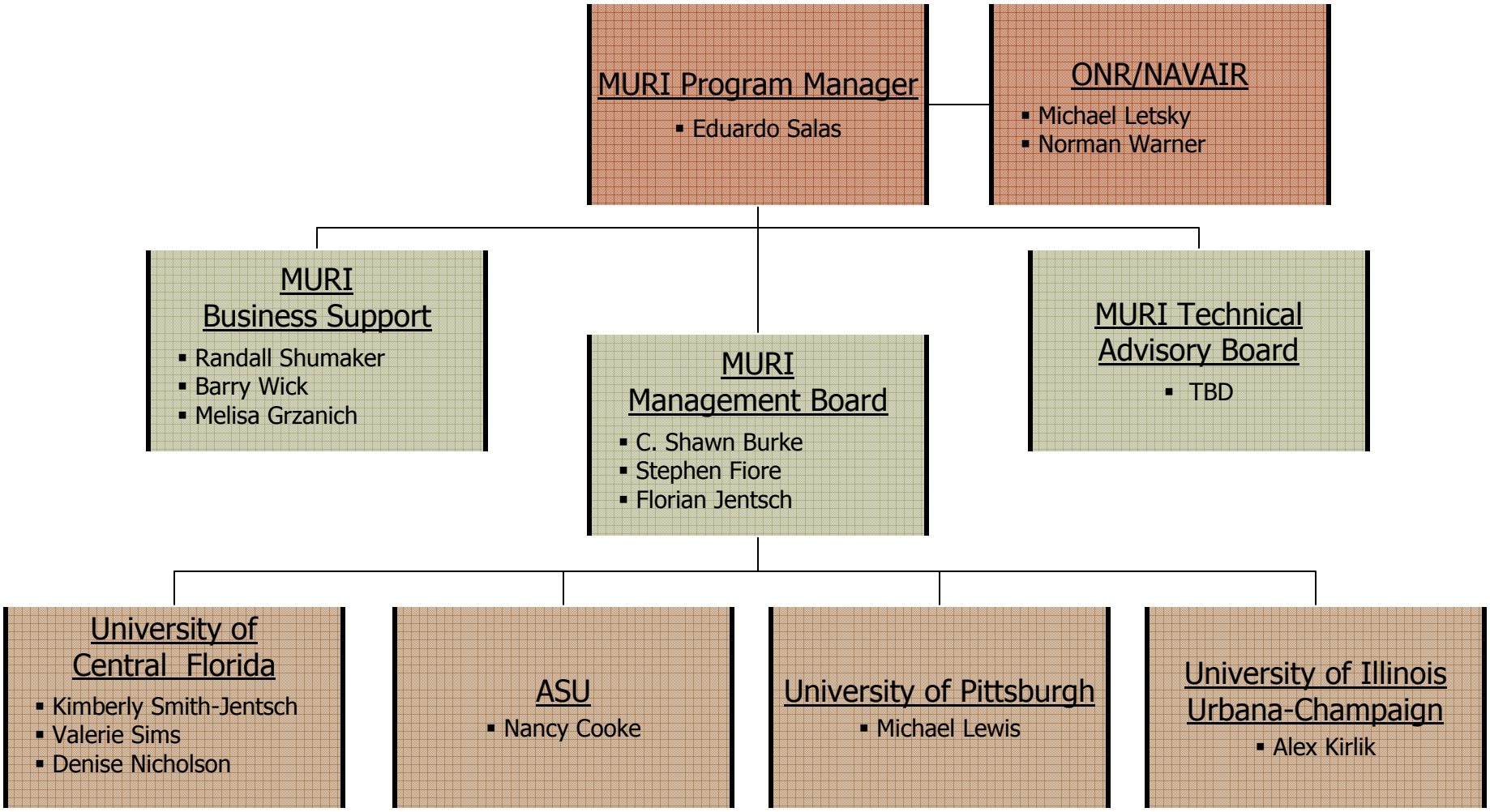
Our Team (cont.)

- Graduate Fellows
  - University of Central Florida
    - Helen Boudreaux
    - Moshe Feldman
    - Elizabeth Lazzara
    - Heather Lum
    - Rebecca Lyons
    - Michael Rosen
    - David Schuster
    - Shannon Scielzo
    - Dana E. Sims

Our Team (cont.)

- Graduate Fellows
  - ASU
    - Jasmine Duran
    - Jamie Gorman
    - Amanda Taylor
    - Jennifer Winner
  - University of Pittsburgh
    - Jijun Wang

Management Structure



Scholarly Output

Publications & Presentations:

- Completed:
  - 1 book chapters
  - 7 proceedings papers
  - 13 presentations w/o proceedings
  - 4 working papers
- Submitted/Under review:
  - 1 edited book, in preparation
  - 1 journal manuscript
  - 1 book chapter
  - 3 proceedings papers

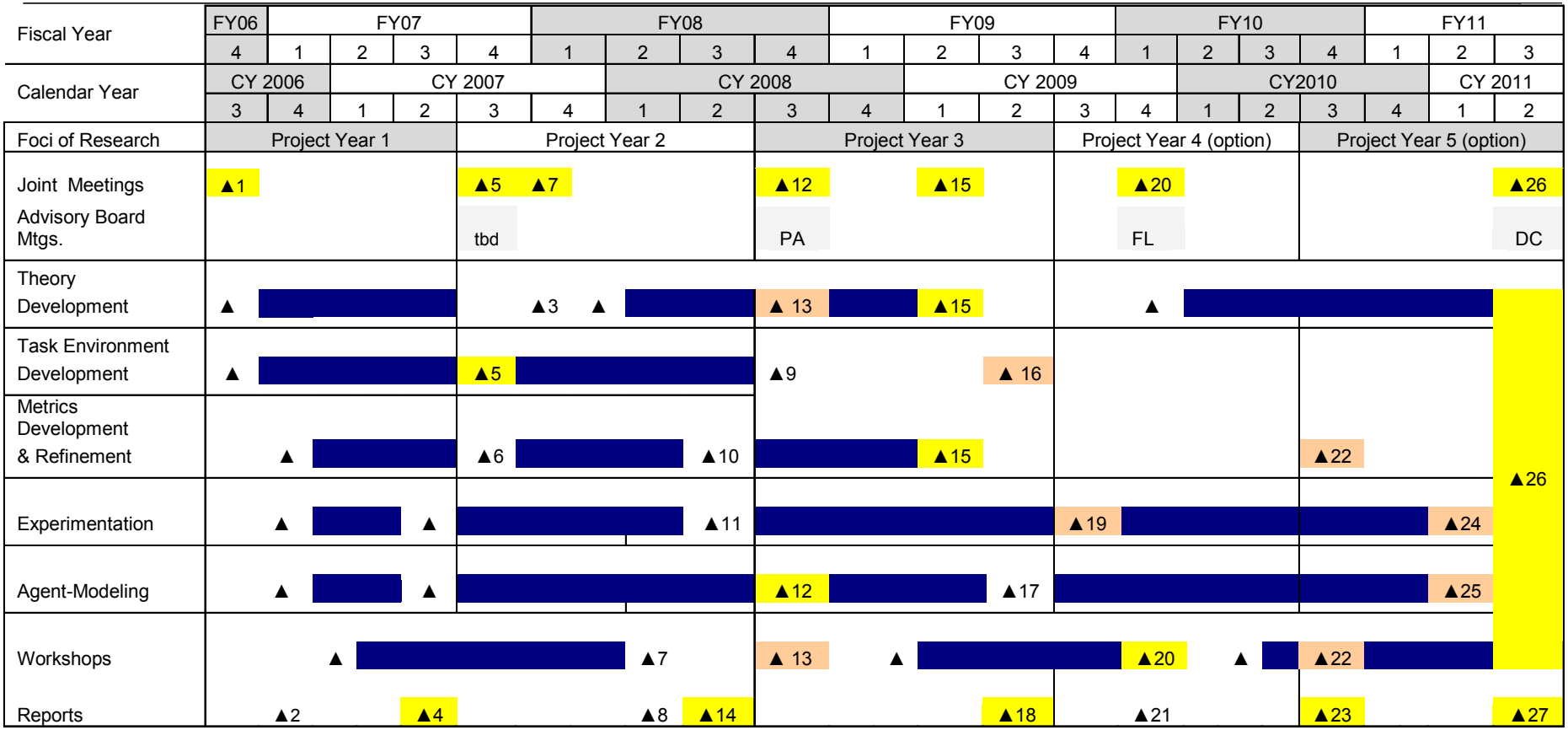
Student Support:

- 15+ Graduate Students
  - Applied Experimental & Human Factors
  - Industrial/Organizational
- 8+ Undergraduate students

Synergies

- Metrics meeting at OSU
- Representation at InGroup

SUMMIT Task Flow and Key Milestones Gantt Chart



Milestones (▲Number):

1) Kick-off meeting (Orlando, FL)
2) Report with minutes of kick-off meeting
3) Report describing the initial theoretical framework
4) Year 1 technical report
5) Joint demonstration of the initial SOC-STE to the sponsor (location to-be-determined), in conjunction with Advisory Board Meeting
6) Exchange of initial metrics and data collection procedures
7) First workshop: Development of theoretical models (Orlando, FL)
8) Report with minutes of the first workshop
9) Specifications/descriptions of the final SOC-STE
10) Exchange of refined metrics and data collection procedures
11) Raw data from the Year 2 experimentation
12) Joint demonstration of initial agent models (Pittsburgh, PA), in conjunction with Advisory Board Meeting
13) Final manuscript of edited book based on Workshop 1 (theoretical models of macrocognition) to publisher

Milestones (▲Number) (cont'd.):

14) Year 2 technical report
15) Joint meeting to exchange the final theoretical model and metrics
16) Final manuscript for edited book on synthetic task environments to publisher
17) Initial validated emulation model
18) Year 3 technical report and base period final report
19) Submission of draft journal manuscript describing the empirical studies
20) Second workshop: Tools and measurement (Orlando, FL), in conjunction with Advisory Board Meeting
21) Report with minutes of the second workshop
22) Final manuscript for edited book on synthetic task environments to publisher
23) Year 4 technical report
24) Submission of a second draft journal manuscript describing the empirical studies
25) Draft special issue of journal special section on team member emulation
26) Third workshop: State of the science (Wash., DC), with Advisory Board Meeting
27) Year 5 and program final technical report; includes minutes from the third workshop