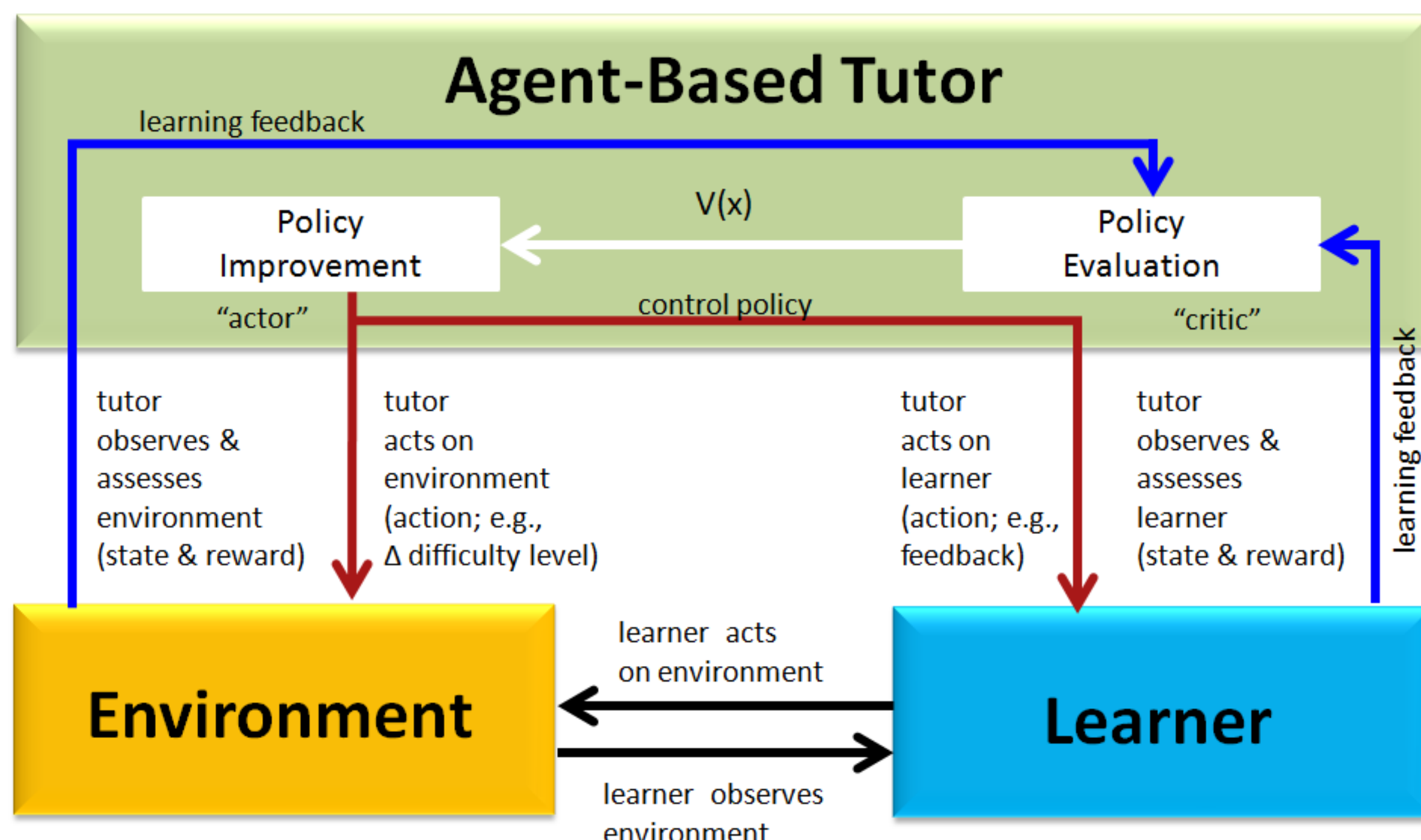


## S&T Campaign: Human Sciences Human Capability Enhancement Training

Robert Sottolare, PhD  
(407) 208-3007  
robert.a.sottolare.civ@mail.mil

## Research Objective

- Develop a Generalized Intelligent Framework for Tutoring (GIFT) including tools and methods to author, deliver, manage, and evaluate adaptive instructional solutions that optimize learning, performance, retention, and transfer for training and educational domains
- Significantly lower the cost and skills needed to author effective adaptive instruction



## Challenges

- Create a domain-independent architecture that can be used to author adaptive instruction for a variety of military and non-military tasks (e.g., marksmanship, combat casualty care, logic puzzles) in different domains (e.g., cognitive, affective, psychomotor, and collaborative)
- Modeling of learners, teams, and optimal instructional strategies/tactics selection methods
- Create authoring tools to enable instructors and researchers to develop adaptive content with minimal computer programming and instructional design skills



Adaptive Instructional Task Domains

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

## ARL Facilities and Capabilities Available to Support Collaborative Research

- Powerful suite of domain-independent adaptive training and education authoring tools available online
- Free registration and free hosting for course and experiment authoring materials
- A selection of papers regarding GIFT are:
  - Sottolare, R., Brawner, K., Sinatra, A. & Johnston, J. (2017). An Updated Concept for a Generalized Intelligent Framework for Tutoring (GIFT). Orlando, FL: US Army Research Laboratory. May 2017. DOI: 10.13140/RG.2.2.12941.54244.
  - Sottolare, R.A., Burke, C.S., Salas, E., Sinatra, A.M., Johnston, J.H. & Gilbert, S.B. (2017). Towards a Design Process for Adaptive Instruction of Teams: A Meta-Analysis. International Journal of Artificial Intelligence in Education. DOI: 10.1007/s40593-017-0146-z.
  - Brawner, K., Sinatra, A., Sottolare, R. (2017). Motivation and Research in Architectural Intelligent Tutoring. Special Issue of "New trends of simulation and process modeling in multiple domains: from business and production to healthcare, defense and environmental sustainability" in International Journal of Simulation and Process Modelling. Vol. 12, Nos. 3/4, 2017, pp. 300-312.
- ARL's Adaptive Training Team is available to assist with use of Cloud GIFT - Virtual Open Campus
- GIFT has been used to conduct experiments, provide adaptive instruction, and promote evaluation of tools and methods

## Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- The Adaptive Training Team has expertise in:
  - Human Factors and Cognitive Psychology research methods
  - Cognitive modeling techniques that account for data-driven knowledge and skill representations
  - Instructional management and tutorial planning practices based on uncertainty and probabilistic modeling techniques such as Markov Decision Processes
  - Domain modeling practices and ontologically driven architecture implementations
  - Sensor technologies that provide unobtrusive assessment of individuals and shared states in relation to learning, performance, and retention
- We are interested in collaborating with researchers and instructors in varying domains (both well-defined and ill-defined) who would like to conduct experiments or create adaptive instruction using GIFT
- We are interested in feedback from instructors and researchers about GIFT and authoring tools to improve the user experience
- Learn more about GIFT at: [www.GIFTtutoring.org](http://www.GIFTtutoring.org)



Books in the Adaptive Tutoring Series