

## Early Synthetic Prototyping (ESP)

2015-present

Early Synthetic Prototyping (ESP) is a research project sponsored by ARCIC and ASA(ALT) looking at ways to leverage emerging synthetic immersive environments to foster innovative design and testing. ESP seeks to bring the Soldier (i.e. the end user) into the design and testing process at very early stages, helping to connect those that design/build (engineers) and those that employ (Soldiers). ESP also is being designed to enable testing of very nascent concepts and explore not only the art of the possible for today, but tomorrow as well.

ESP is very different than existing game/simulation engines. At the core of ESP are a new generation of metrics and analytics that focus on the wants and needs of the user, tracking not only their performance – \*what\* they did – but also \*how\* and \*why\* they did things. Current synthetic environments track fairly traditional metrics giving data largely as scores with easily quantifiable outcomes. In order to provide useful information back to a designer/engineer, ESP will need to assess a number of softer metrics such as user frustration. In addition, deeper granularity will be tracked as well – e.g. source of frustration (equipment design, team members, opponents, system performance, etc.

ESP is currently in the early prototype stage, and in fact is using the working ESP schema to facilitate understanding the requirements that enable creativity and innovation through ESP. These exploratory environments are multi-player and are looking at not only the design of next-generation vehicles, but also their use in a variety of contexts. Users can make modifications on-the-fly, and help find new ways to not only build but also employ the systems.

Right now the ESP effort is focused on four main areas of research:

1. idea ingest – how you bring an idea or concept into the ESP environment
2. Emerging interfaces – wearable sensors, AR/VR/MR and how/why to use it effectively
3. Analytics – next-generation soft-metrics that are user-focused
4. Community – how to include a larger number of user to leverage a wide body of expertise

The broader ESP effort also includes research work at Naval Postgraduate School, TARDEC, and other Army partners. The initial prototypes are undergoing testing and will inform the ESP design and requirements, with FY16 efforts focused on building a v1 system along with ongoing research into the four vectors listed above.

Project Leader: Todd Richmond

At the University of Southern California Institute for Creative Technologies leaders in artificial intelligence, graphics, virtual reality and narrative advance low-cost immersive techniques and technologies to solve problems facing service members, students and society.

