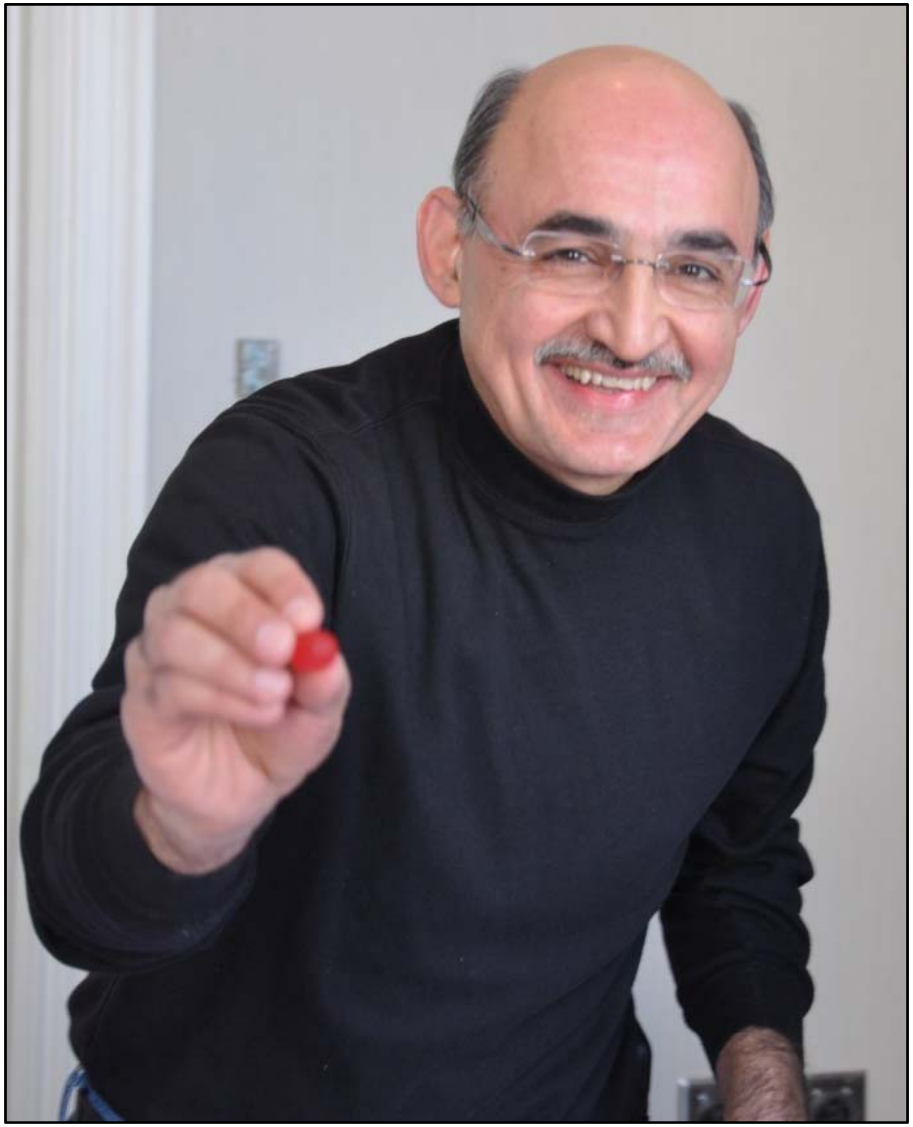
Breakout Session 1:
Human-Machine Cooperation and Collaboration

Dr. Reza Ghanadan, DSO Program Manager
Dr. Jan Vandenbrande, DSO Program Manager

DSO Proposers Day

June 22, 2016

Reza Ghanadan



Reza Ghanadan

Background:

- B.S. in Physics & Electrical Engineering
- M.S. and Ph.D. in Electrical Engineering
- MBA Management and Finance

Interests:

- Data Analytics, Autonomy, Machine Learning, AI, Robotics, Complex Biological Systems
- Build adaptive systems and intelligent machines that understand and help with what people want
- Effective human-machine systems, seamless teaming and collaboration

Programs:

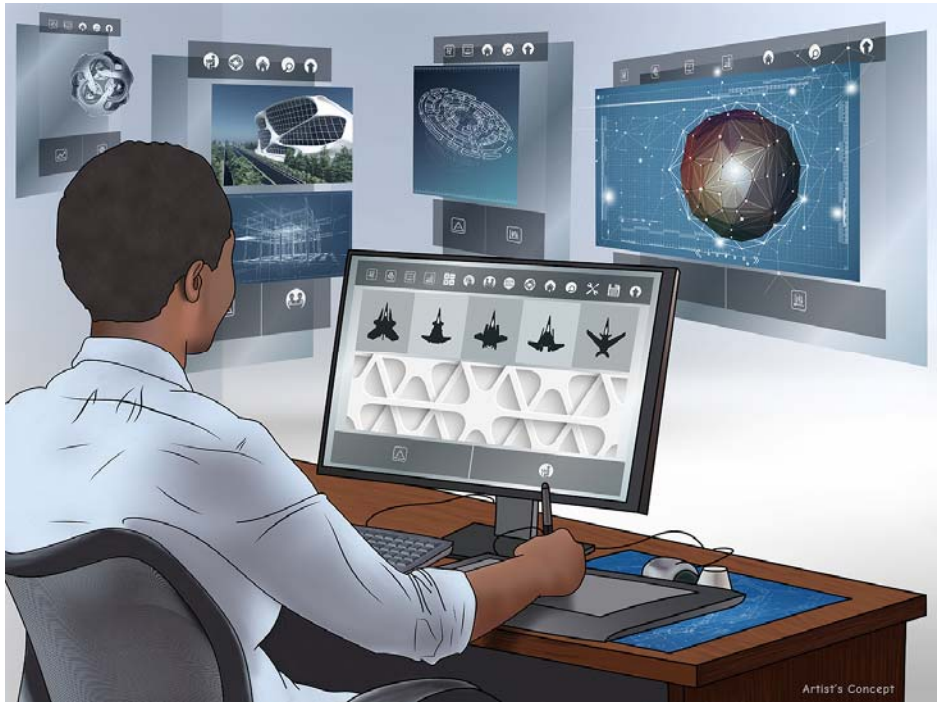
- MSEE: Designing machines that perceive and understand, enabling visual reasoning
- GRAPHS: Analysis of large and complex networks of information for fast and accurate predictive analytics
- SIMPLEX: Analytics and machine learning to accelerate the path from data to hypothesis and scientific discovery in complex systems such as genomics, neuroscience, material science, autonomy, and anthropology
- Fun LoL: Investigate fundamental limits of learning – Teaching machines how to learn more efficiently!

Jan Vandenbrande

- Electrical & Mechanical Engineering
- Geometric modeling & reasoning
- Optimization, machining, composites
- Architect systems to design & build faster, better

Jan Vandenbrande

How can we make computers partners in design?



Transformative Design (TRADES):

- Rethink design
- New materials & fabrication processes
- Math and computational tools
- > 6 orders of magnitude in scale
- Massive computing power
- Design discovery

How we think: The Heilmeier Catechism

Important questions to consider when approaching DARPA with ideas:

- What are we trying to do? (no jargon!)
- How does this get done today?
- What is new about your approach?
- If we succeed, what difference do we think it will make?
- How long do we think it will take?
- Can we transition (to the DoD or others)?
- How much will it cost?

LCD Pioneer

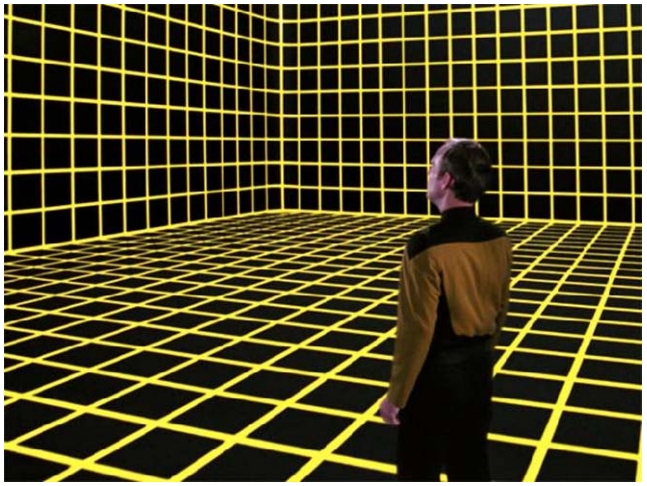
Heilmeier

Source: Wikipedia.

Human Machine Collaboration (HMC) Break Out Session

Goal: Discuss how to create the future for HMC

Session time: 60 minutes



http://www.startrek.com/article/meet-the-man-behind-the-holodeck-part-1

HMC Breakout interests:

- Emerging trends in HMC
- Breakthrough technologies
- Existing technology gaps and challenges
- Possible solutions to overcome defined technology gaps and challenges
- Key technical insights from this approach that could enable success

Not as interested:

- Description of existing approaches or evolutionary progress (e.g. Siri will be better and faster, Siri will be able to translate)
- Speculative concepts not grounded in some evidence (e.g., Start Trek transporter)
- Individual program proposals