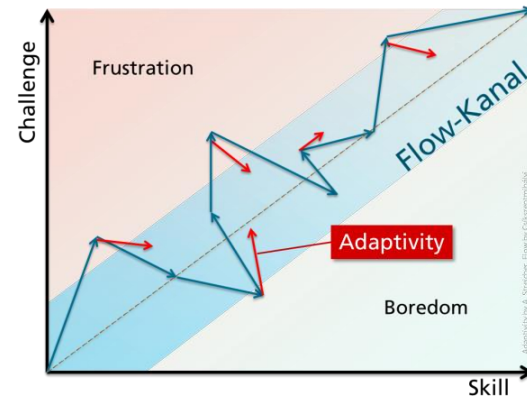


TOWARDS AN INTEROPERABLE ADAPTIVE TUTORING AGENT FOR SIMULATIONS & SERIOUS GAMES

4th International Conference on Theory and Practice in Modern Computing
22 – 24 July 2015, Las Palmas de Gran Canaria



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AGENDA

- Simulators & Serious Games for Image Interpretation
- Application example
- Interoperable Tutoring Agent
 - Ideas, Concepts
 - Models & Schemas
 - Prototype
- Summary

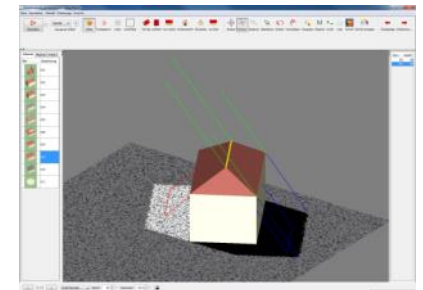
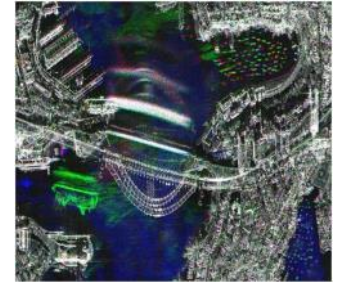
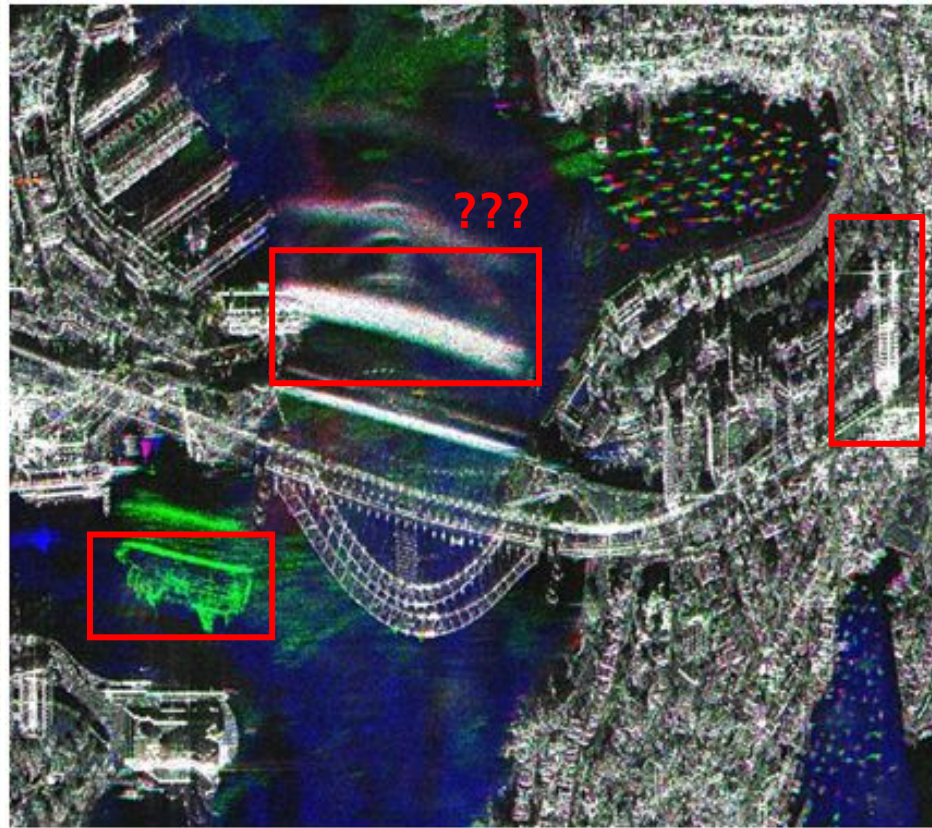


Image Interpretation – Radar



Optical Image – Source: Google

Optical

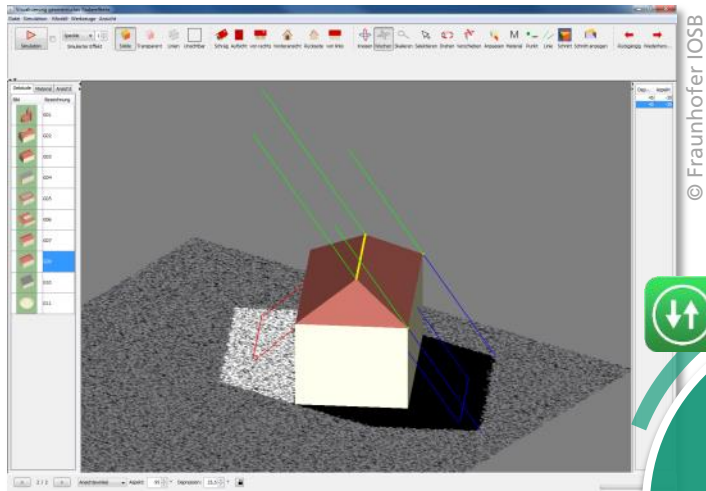


TerraSAR-X Image – Source: Infoterra

Radar
(SAR)

Simulators & Serious Games for Image Interpretation

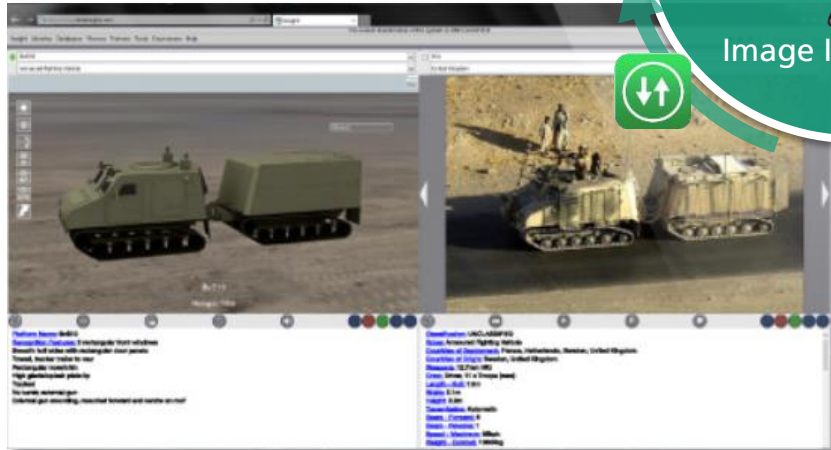
ViSAR



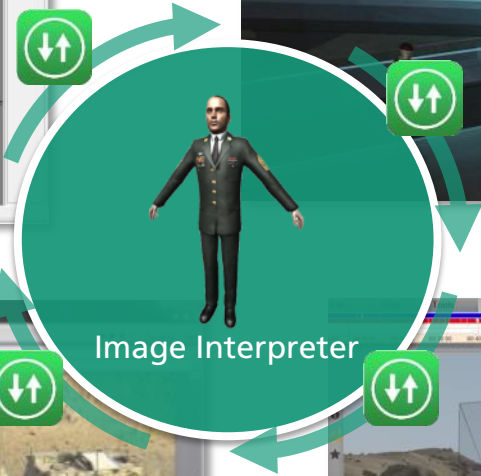
„Lost Earth 2307“



INSIGHT



VBS3



Serious Game A

Lost Earth

Lost Earth

...



Simulator B

ViSAR

VBS3

Time

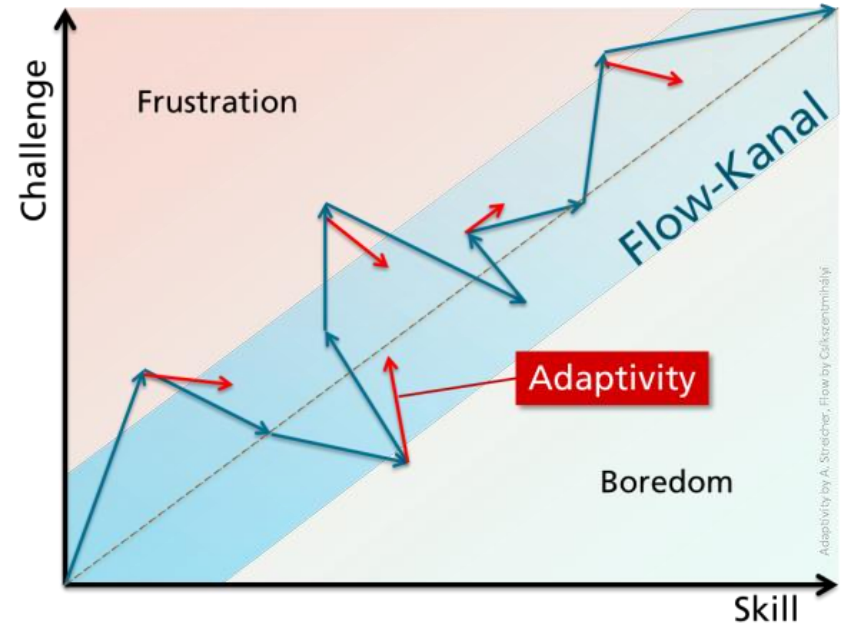
Adaptivity Scenario, Application

Game



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- Linear game
- Difficulty adjustment solely on internal user model
- No externally guided recommendations



Adaptivity → Flow → Immersion

Adaptivity Scenario, Application

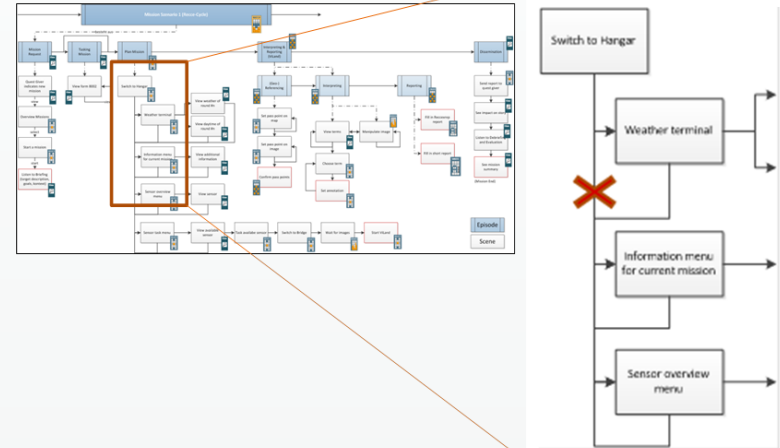
Game



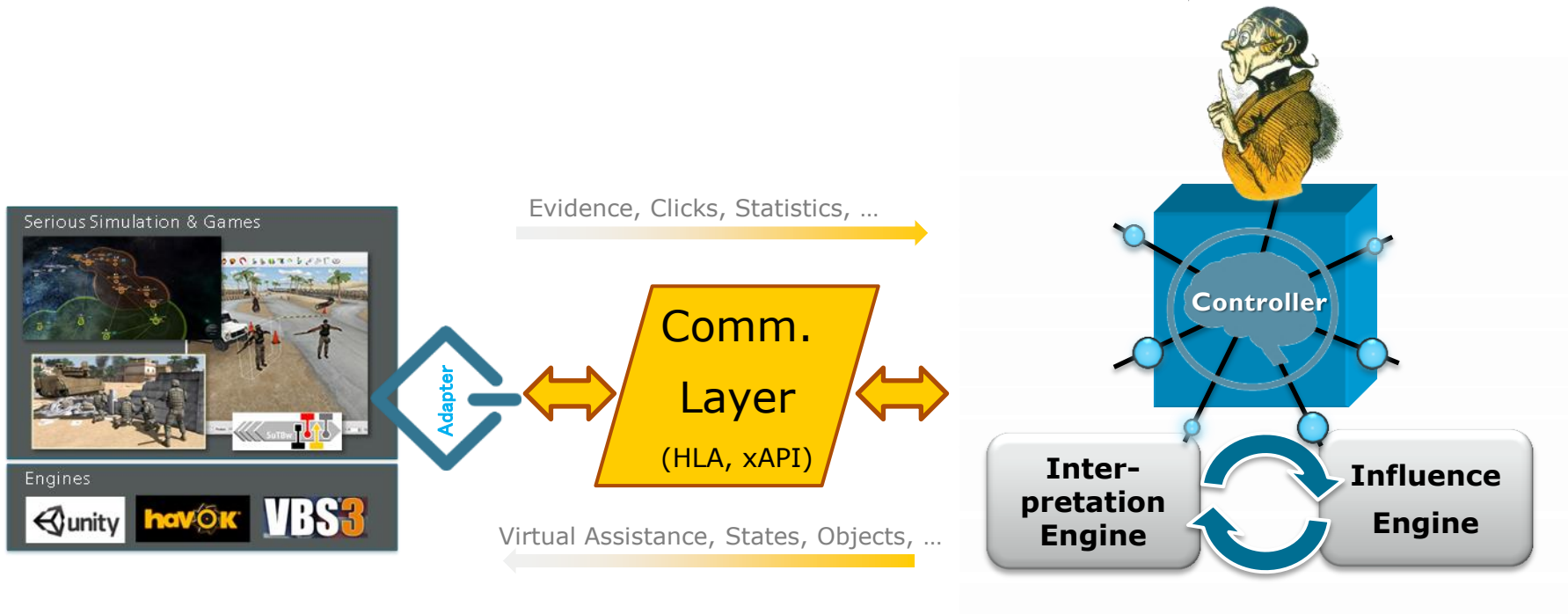
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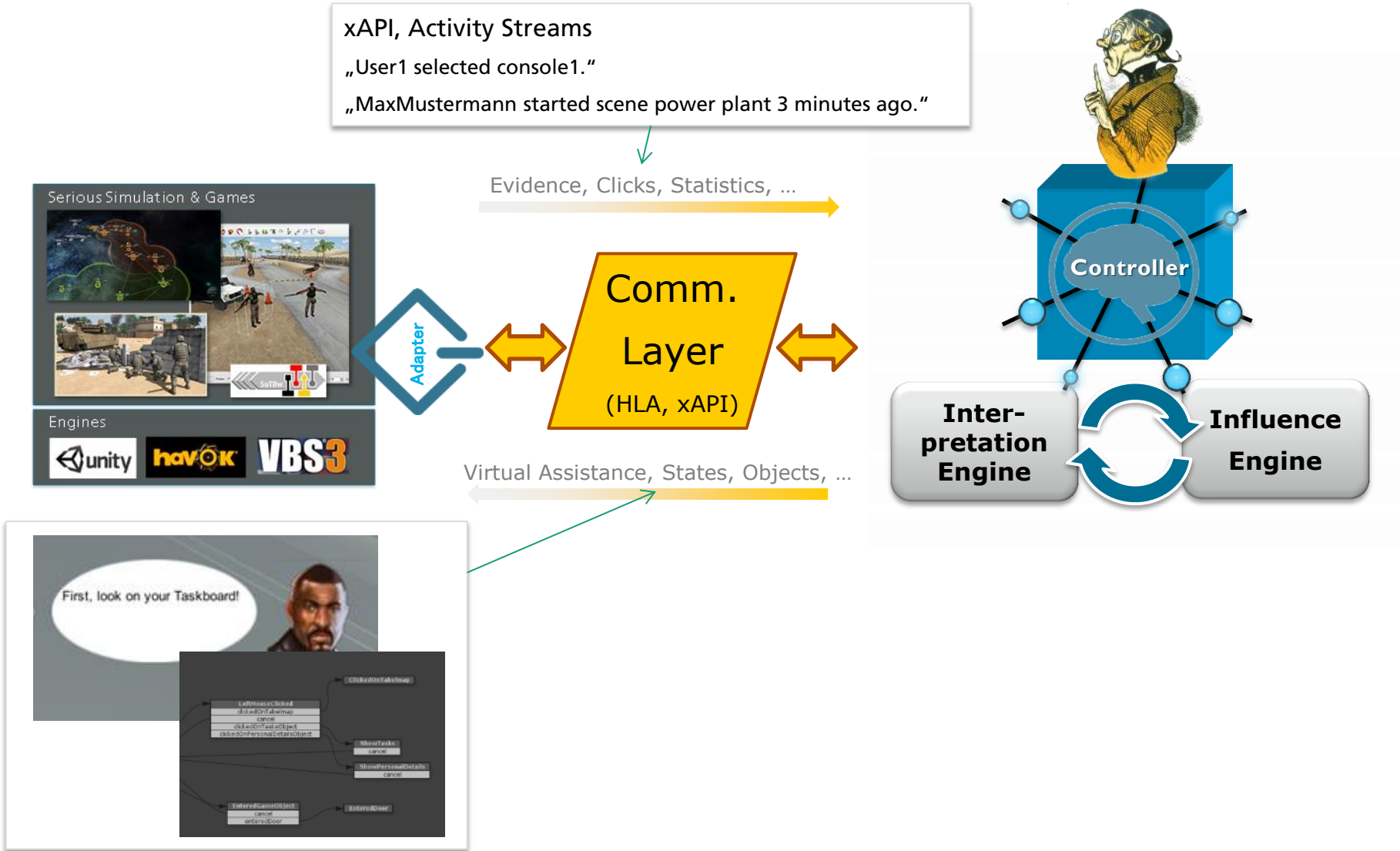
Dynamically adjusted game mechanics & content



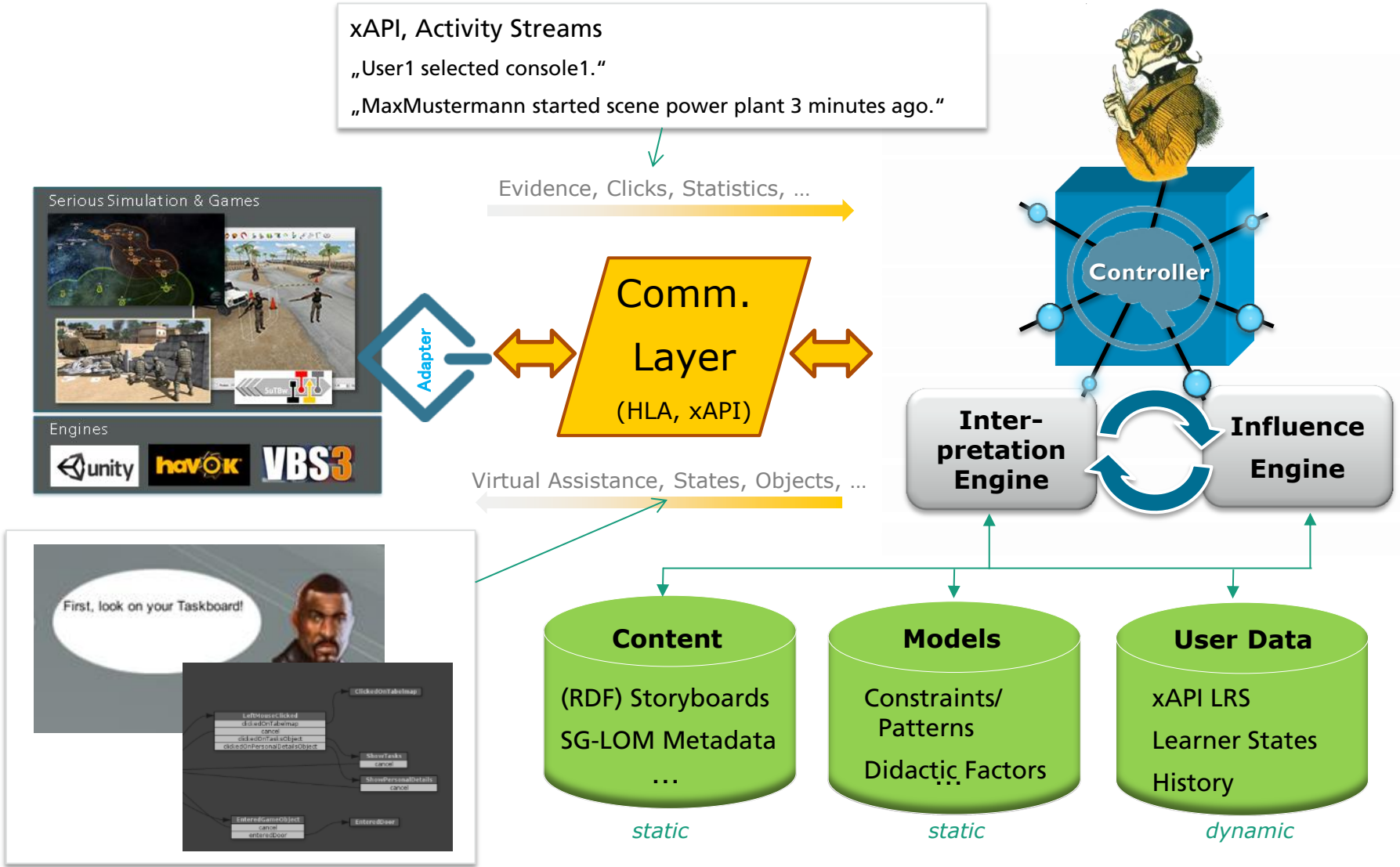
Architecture Interoperable external Tutoring Agent



Architecture Interoperable external Tutoring Agent

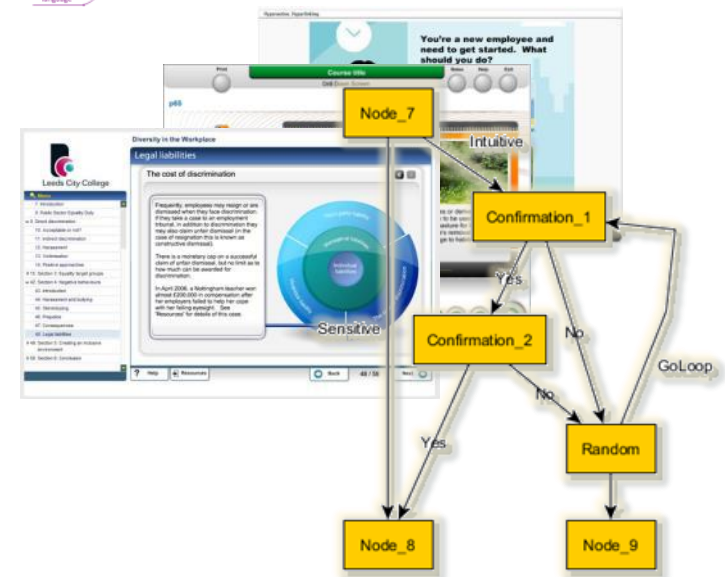
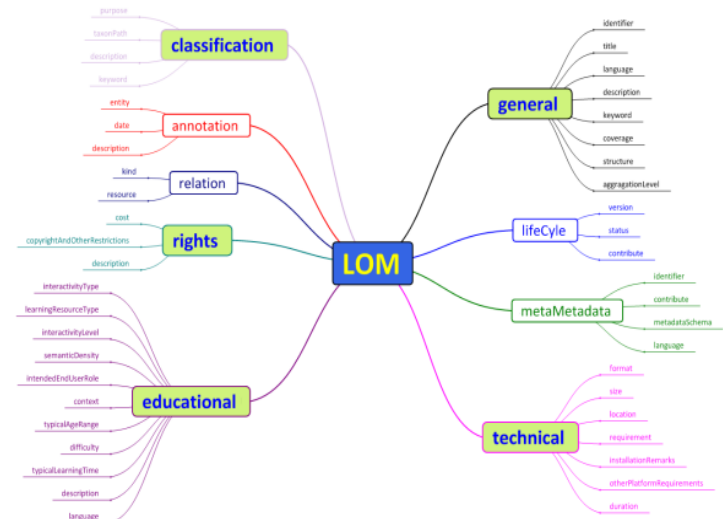


Architecture Interoperable external Tutoring Agent

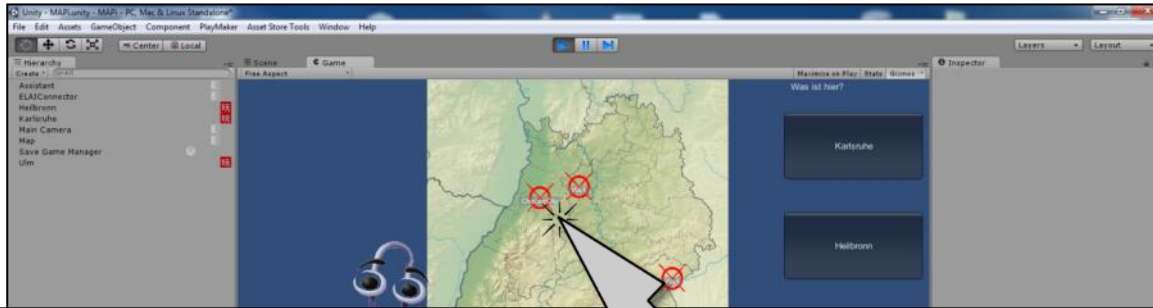


Models & Schemas

- Ideas & concepts from ITS
- IEEE Learning Object Model (LOM) content container format
 - SG-LOM [ElBorj2014]
- RDF-Storyboards
 - Storyboards [Fujima2013]
 - Logic reasoning, inference
 - → Semantic interoperability
- Aspects from Web-Didactics [Swertz2004]

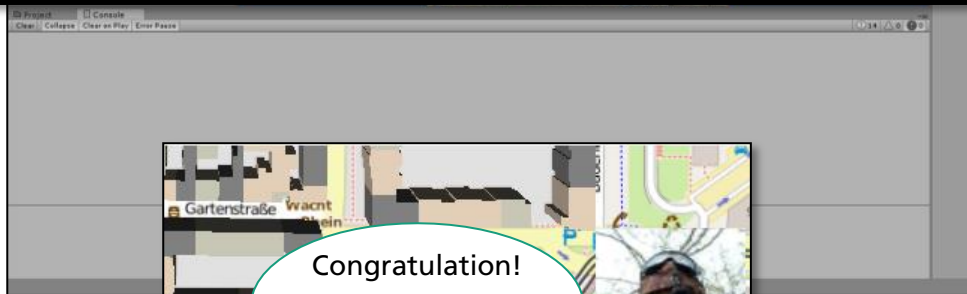


Unity Prototype for Seek&Find Game (Work in Progress)



HLA, SOAP
User Model Storage (xAPI)
Assistant Injection
Semantic Analysis (Cyc)

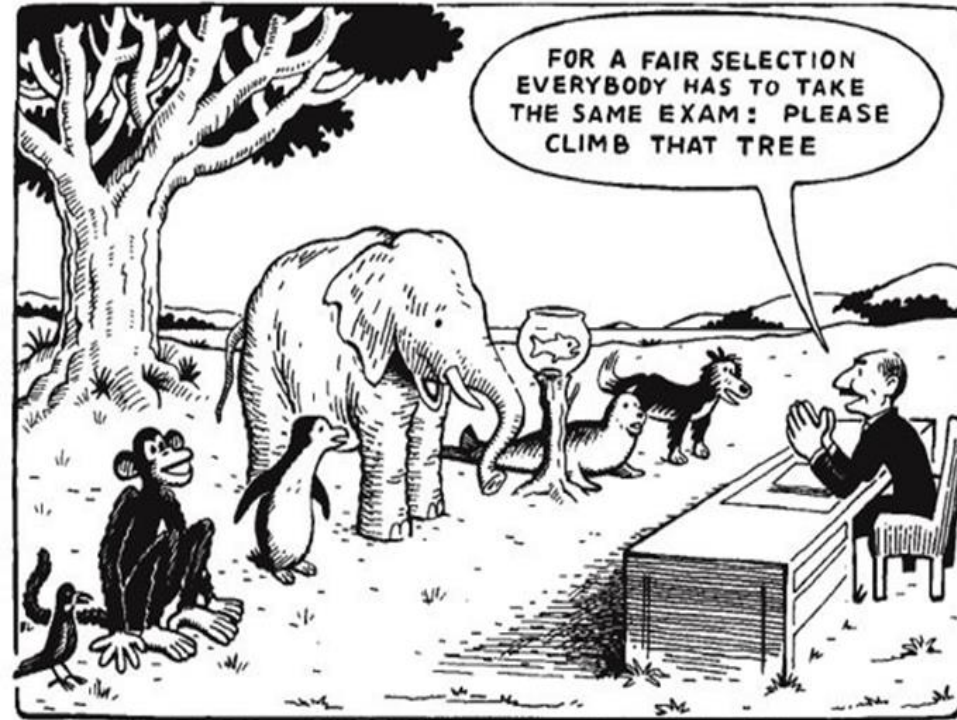
```
] Mouse Pos: Point2D.Float[440.0, 309.0]Object Karlsruhe_-1082  
] ELAIQuery [query=Karlsruhe_-1082,evaluable=true, splitquery=[Karlsruhe, 1082], cycConstantsMap={Karlsruhe=Karlsruhe}]  
] Karlsruhe  
] tinkergraph[vertices:1 edges:0]
```



3D In-Game Assistant
(→ "Tutor")

Summary

- Exploitation of multi-usage data of simulators/games for adaptivity
- Interoperability architecture using standards
- Transfer of ITS principles to simulations/games
- WIP prototype with Unity
- Outlook:
Adaptive Simulations & SG,
Evaluation



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*Thanks for your
attention! Questions?
Comments?*



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