



AI Based Game Design

Mirjam Palosaari Eladhari

Founder, Otter Play



GDC EDUCATION
SUMMIT

GAME DEVELOPERS CONFERENCE®

MOSCONE CENTER · SAN FRANCISCO, CA

MARCH 2-6, 2015 · EXPO: MARCH 4-6, 2015



Why I'm giving this talk - I want to show how:

- to enable students to expand their palette as game designers - adding AI approaches and emerging interfaces and hardware.
- an expanded tech-palette is empowering - but it also shows how vast the design space is - lots of uncharted territory. Room for innovation.
- the tech-palette can be composed to be useful for both students who can program and for those who won't .



AI Based Game Design

When the AI is central to the game design,
and in the foreground.

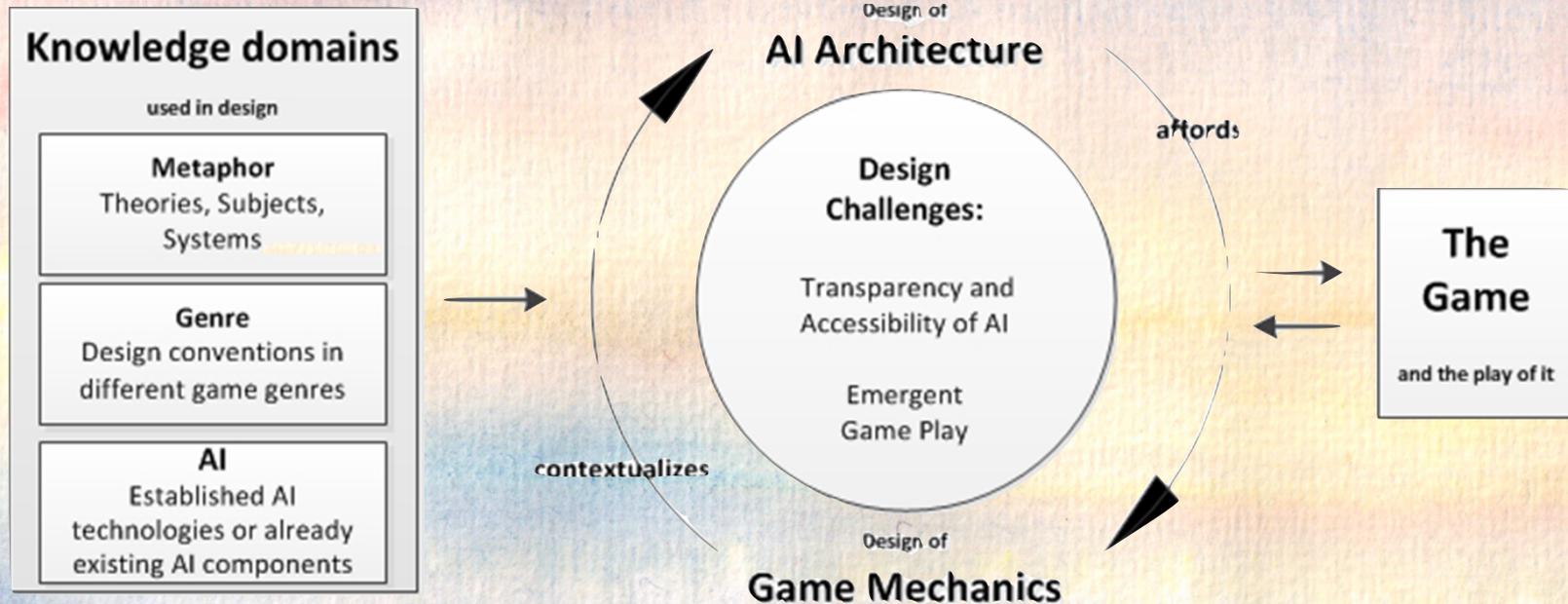


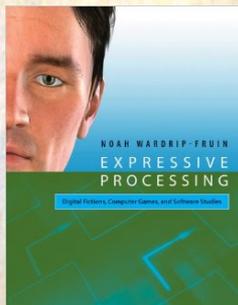
Fig 1 The process of designing AI-based games

Diagram is a joint effort of Josh McCoy, Anne Sullivan, Gillian Smith, and me (2011, Santa Cruz)

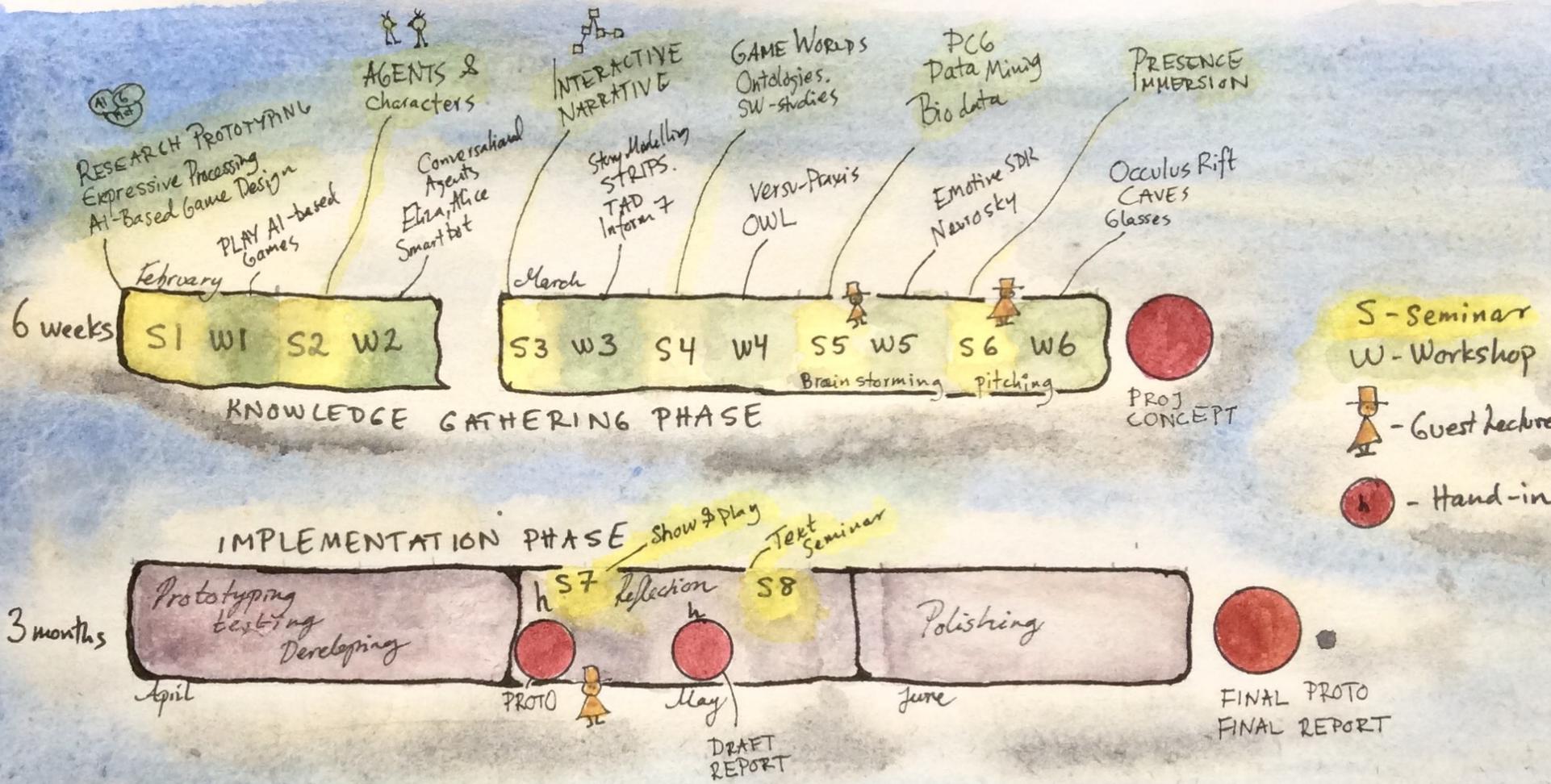


Course: Computational Expression

- Masters' level course, 5 ECTS.
- Given at the Institute of Digital Games at the University of Malta
- Majority of students were programmers.
- Students had prior game design knowledge
- Text seminars
- Workshops
- Guest lectures
- Game prototyping
- Reflection

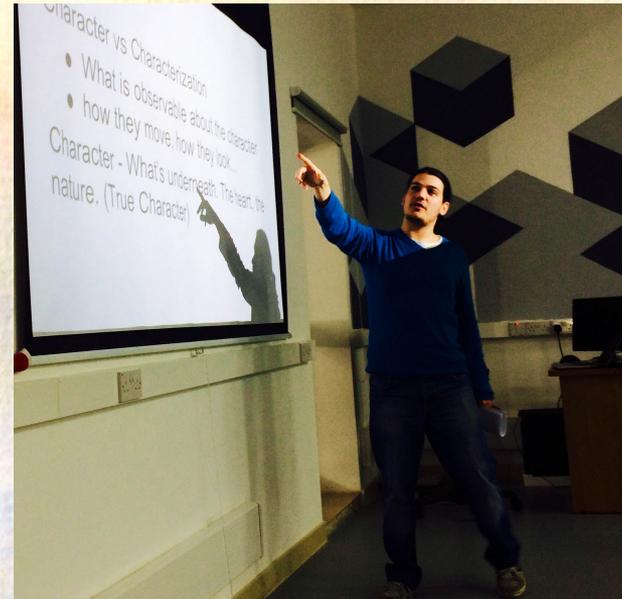


+ papers
& articles





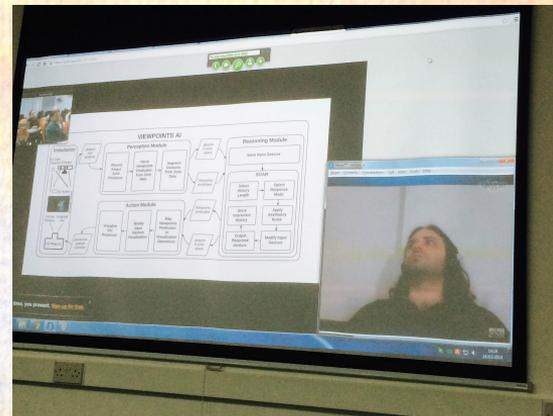
Text seminars, championed





Guest Lecturers - Showing practice

- Richard Evans on narrative in Versu, and BDI in Black&White
- Gillian Smith on PCG - The Endless Web
- Brian Magerko on improvisation and agents - Viewpoints AI
- Noah Wardrip-Fruin on expressive processing





Workshops - trying hands-on



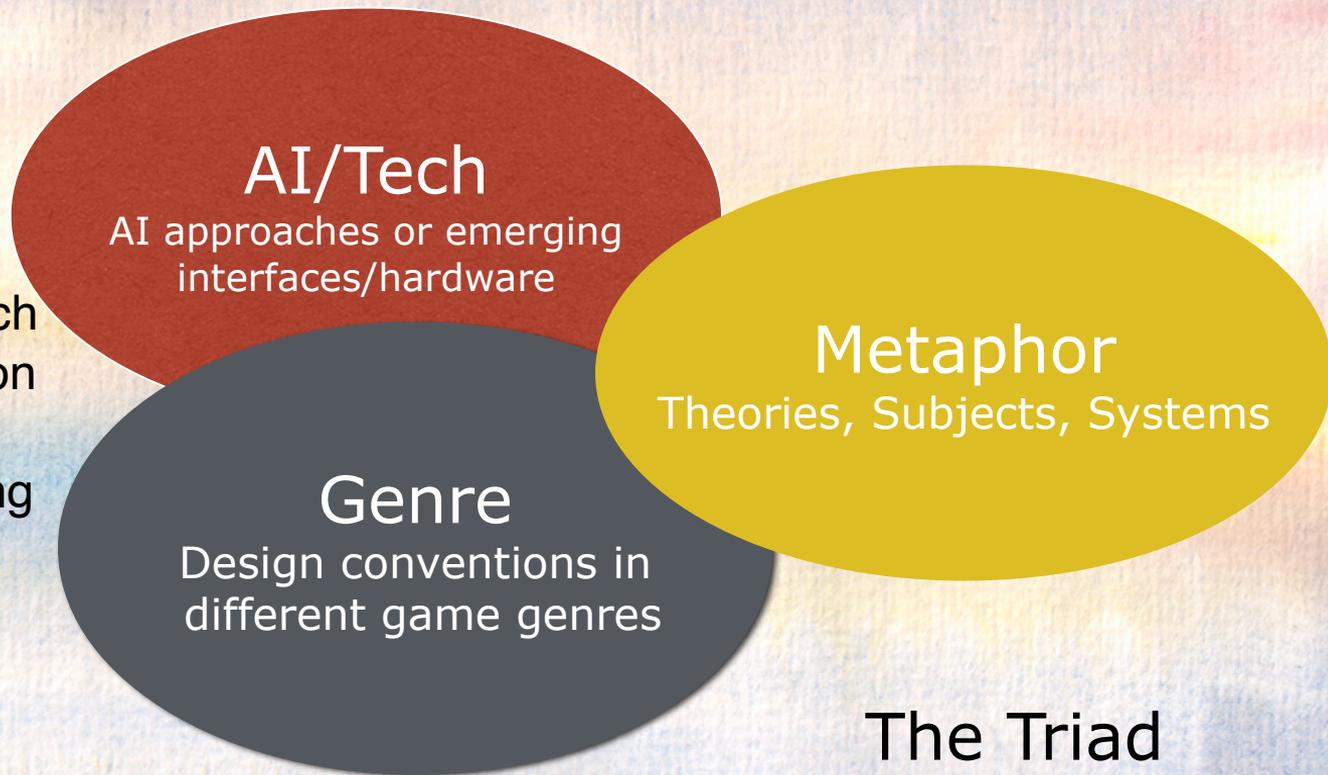
SO





Task:

Make a playable prototype using a central AI or technology, using a rich metaphor as inspiration for the game mechanics, while being aware of any genre conventions used (or not).





Students' dev process

- Conceptualization
- Prototyping
- Play-testing & Iteration
- Reflection
- Finalizing & polishing





example games - AI

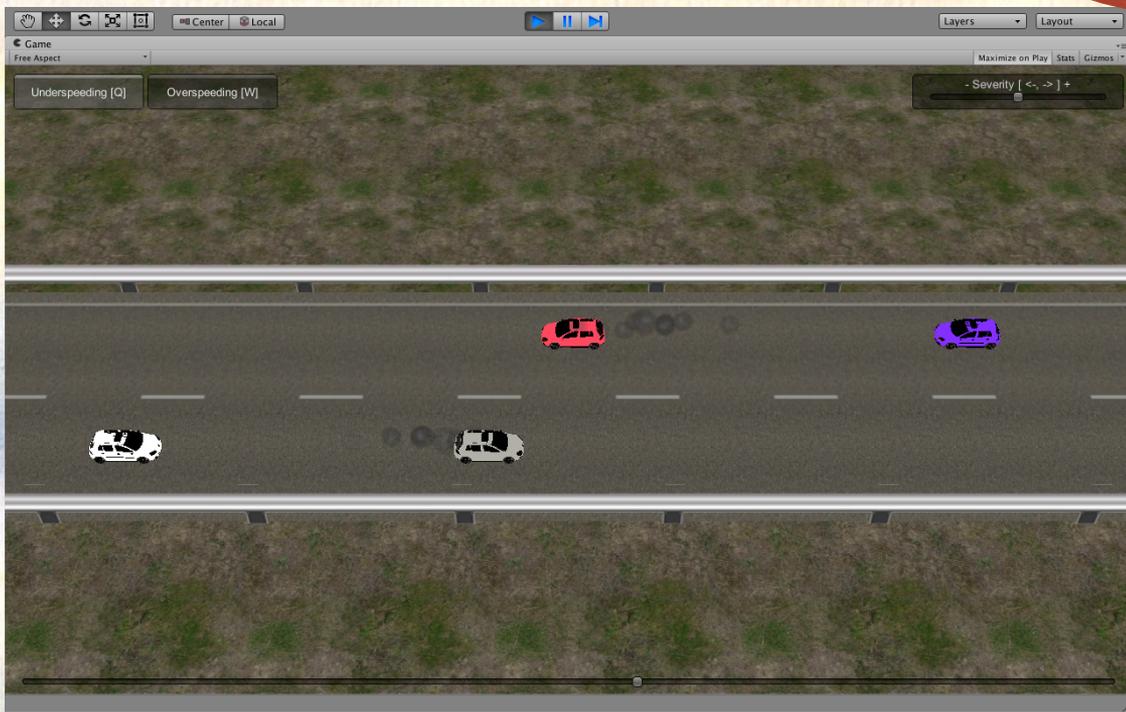


Haiwaicode

Machine
learning

Car traffic

Racing



By Vincent
Farrugia and
Alan Pirotta



Compoblocks

PCG

Music
composition

Platformer



By Luke
Aquilina and
Karl Grech

COMPOBLOCKS

CREATE YOUR OWN MUSIC!

Start Game

Instructions

Quit



Organatron



PCG,
Genetic
Algorithms

Robot
wars

Strategy

By Noel
Cuschieri and
Matthew Agius



MEGA SWAP SUCKER!

MEGA SWAP SUCKER!

MEGA SWAP SUCKER!

ROUND: 2/4

SCORE P1: 1

SCORE P2: 0

DOROTHY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
---------	-------------------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MARK
--------------------------	--------------------------	--------------------------	-------------------------------------	-------------------------------------	------

WILLIAM	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
---------	-------------------------------------	-------------------------------------	-------------------------------------	-------------------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RAMBO
--------------------------	--------------------------	--------------------------	-------------------------------------	-------------------------------------	-------

RYAN	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
------	-------------------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

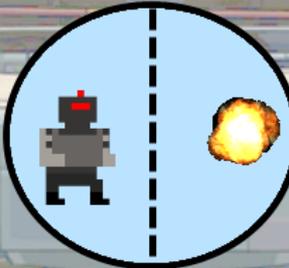
<input type="checkbox"/>	<input checked="" type="checkbox"/>				
--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	-------------------------------------

TOMTOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------	-------------------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	EGGS
--------------------------	--------------------------	--------------------------	-------------------------------------	-------------------------------------	------

RIPLEY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------	-------------------------------------	-------------------------------------	--------------------------	--------------------------	--------------------------

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	GARY
--------------------------	--------------------------	--------------------------	-------------------------------------	-------------------------------------	------



PLAYER 1

GO!



Dungeons & Maybe Dragons

- game master phone app

PCG
& Quest
flags

Dungeon
crawlers

RPG &
Game
mastering



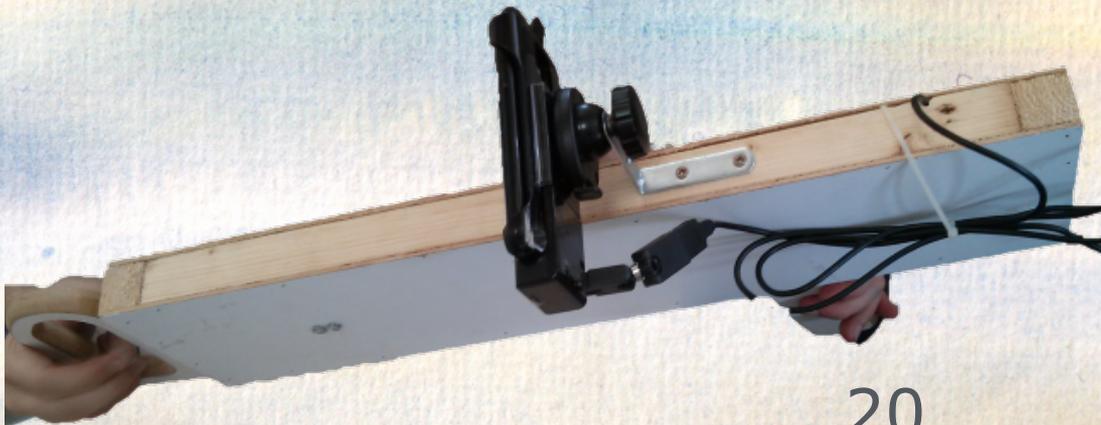
By Jean-Luc
Portelli and
Andrea Piano



example games -
input technologies



Herakles



By Stelios Avramidis, Joseph Darmanin and Michael Camilleri

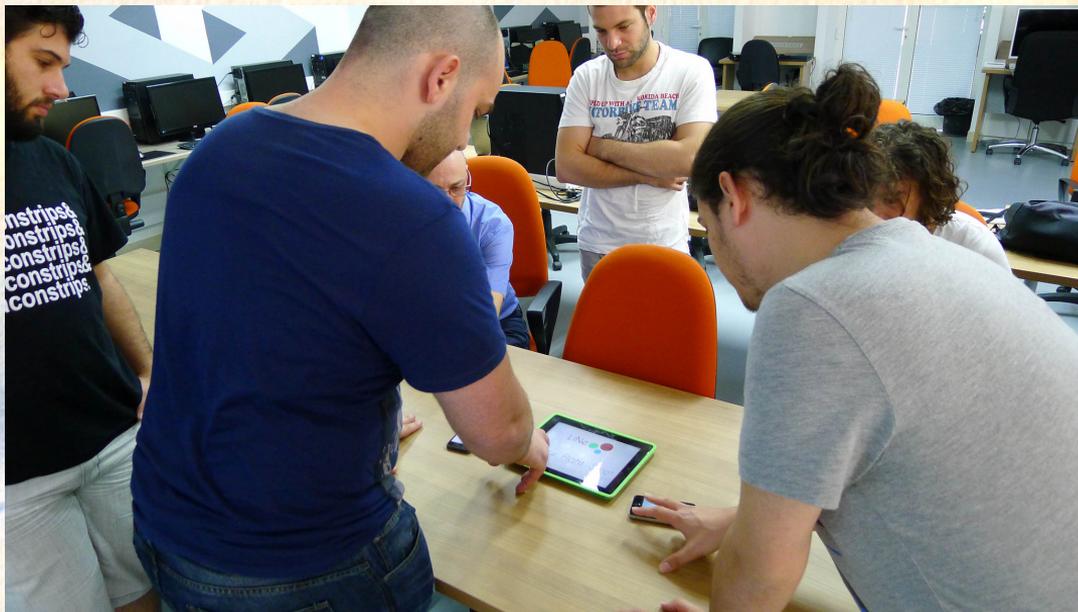


Line

Ipad
finger input

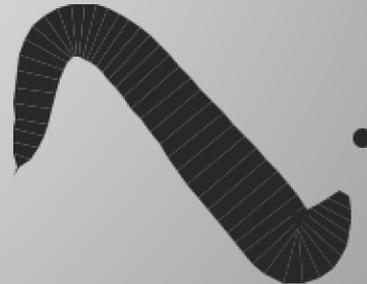
Minimalism
(art)

Yellowtail

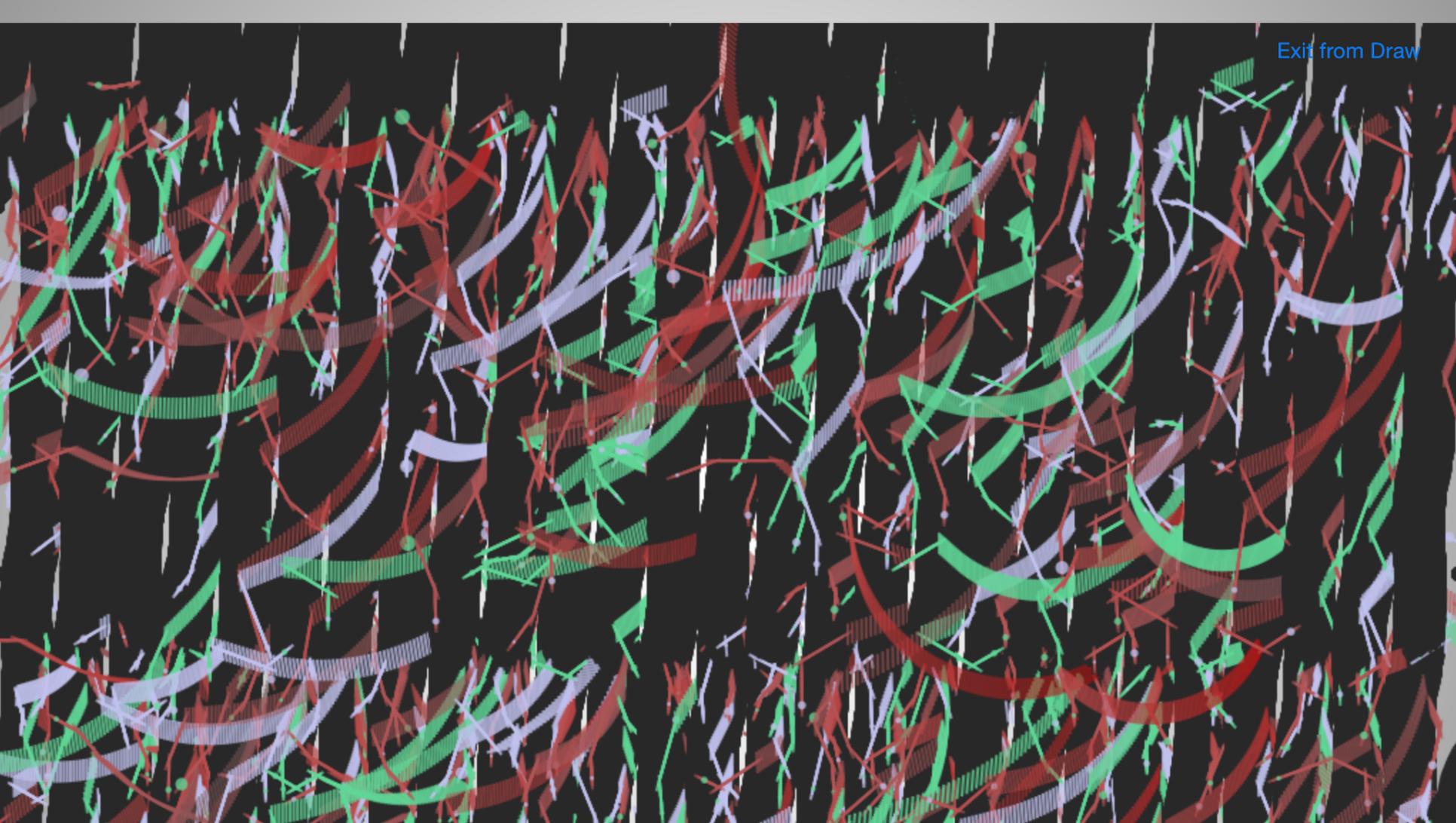


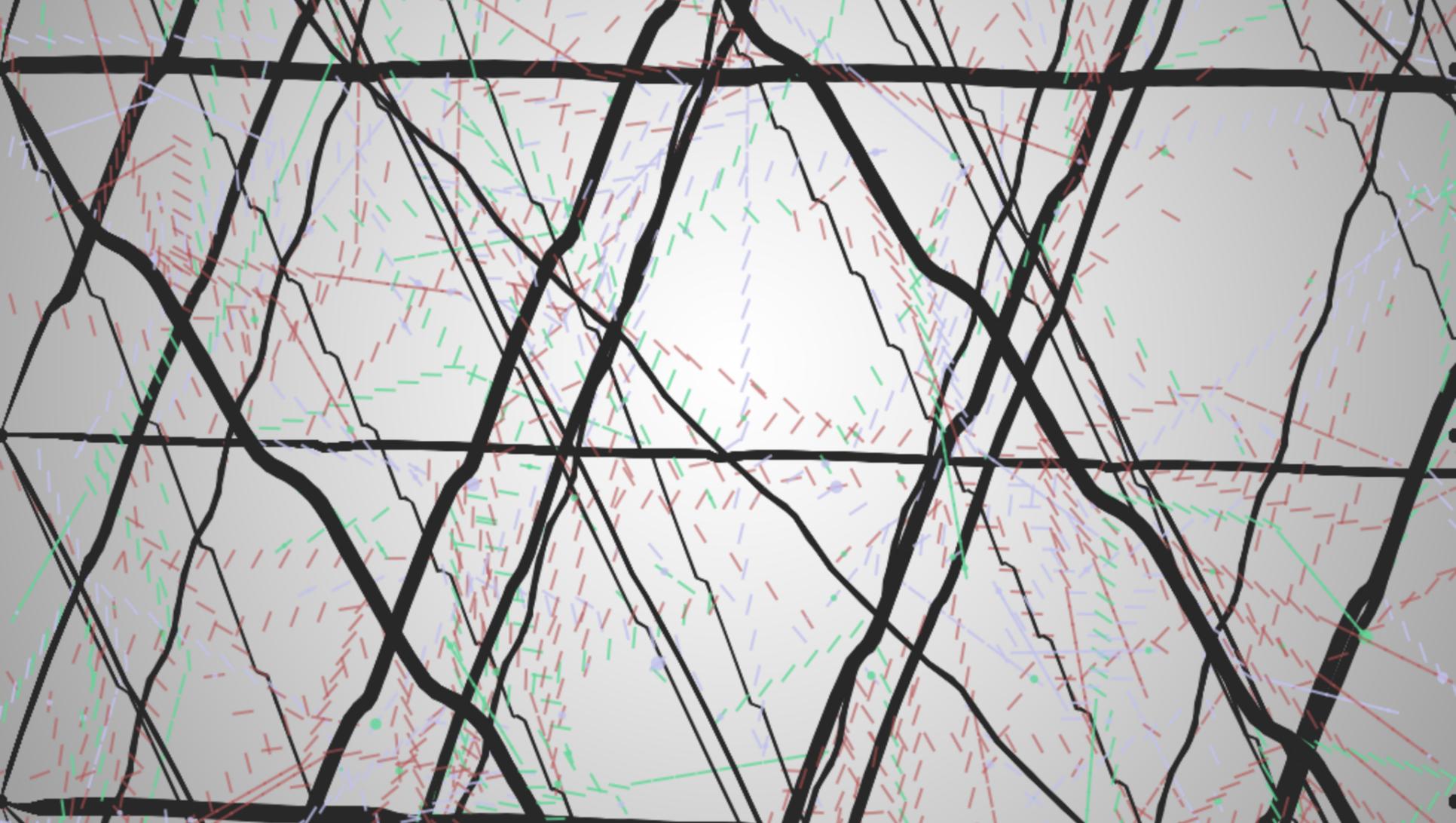
By David
Chircop and
Gary Hili













Reflecting and Reporting

Development stop ->
time for reflection and
reporting.

Writing, sending text
forward in reading chain.



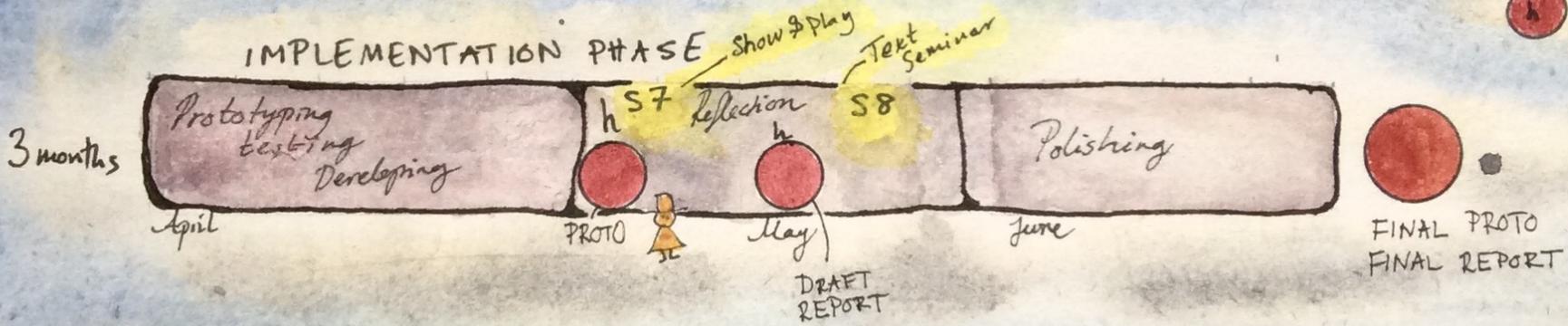
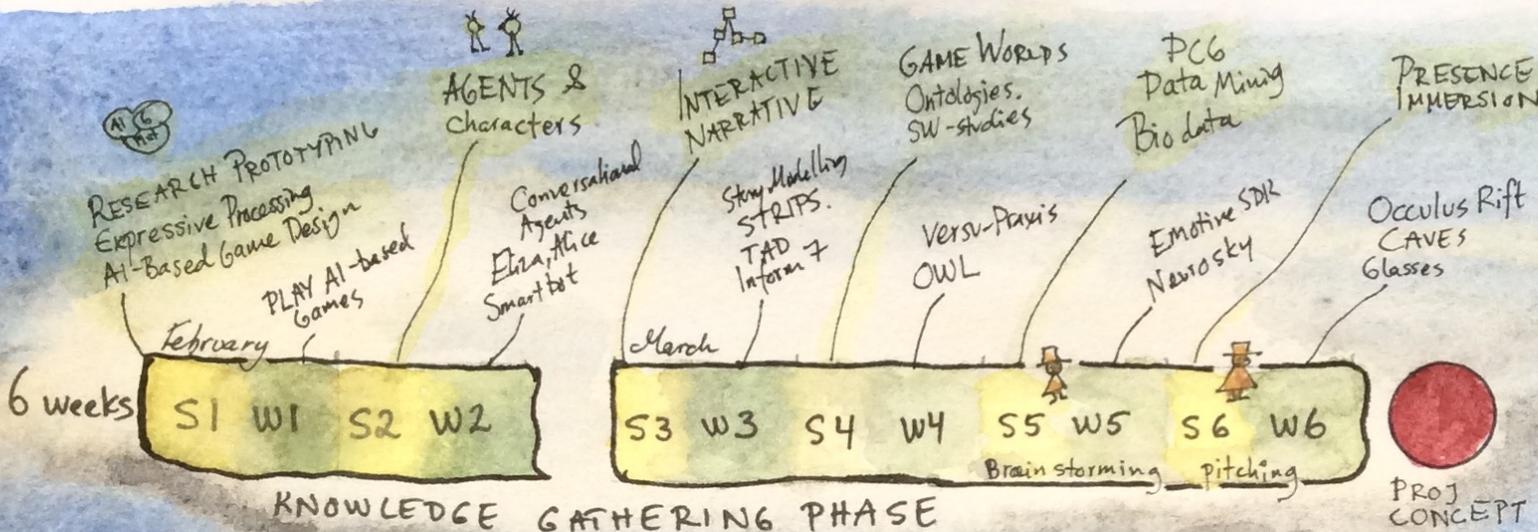
Text seminar

Computational Expression in own practice, and the future of the field



Reflection Phase

- How did the technology affect the design?
- How did the design affect the technology?
- If you used a genre, a hybrid genres, or no genre - how did that affect your design and your approach to the technology used?
- How did the knowledge domain or theory used affect the design?
- What other types of expressive computational technologies could have been useful for realizing your design or core idea? Reflect on whether use of those would have had impact on your design, and if so, how.





Summary & Lessons Learned

- Groups who put a strong focus on the metaphor, the knowledge domain, in addition to the AI/tech, generally created the more interesting and innovative designs.
- Combination of project work and classic seminar defense style teaching allowed both concrete prototypes and reflection.
- Outcomes for students:
 - games for portfolios
 - seeds for research papers
 - seeds for thesis topics
 - proof of concepts: feasibility for thesis work or game-to-market
 - (more) realistic views on dev effort for custom AI
 - expanded palette for innovation and development in future career



Thank you for listening!

Questions?

Mirjam Palosaari Eladhari
info@otter-play.com

Download course materials here:
<https://sites.google.com/site/computationalexpression/>