



GDC EDUCATION
SUMMIT

GAME ENGINES IN GAME EDUCATION: THINKING INSIDE THE TOOL BOX?

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GAME DEVELOPERS CONFERENCE March 14-18, 2016 · Expo: March 16-18, 2016 #GDC16



[1] RISE OF THE MACHINES

WHY CARE ABOUT GAME ENGINES?



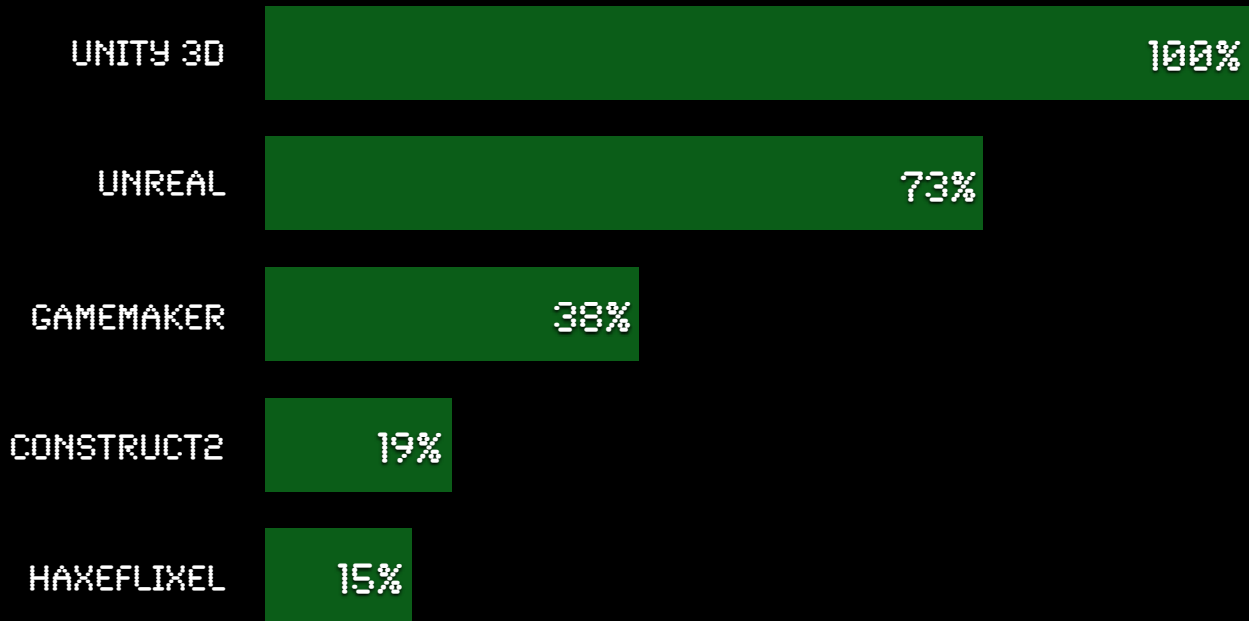
UNITY AT GDC 2009

GDC 15



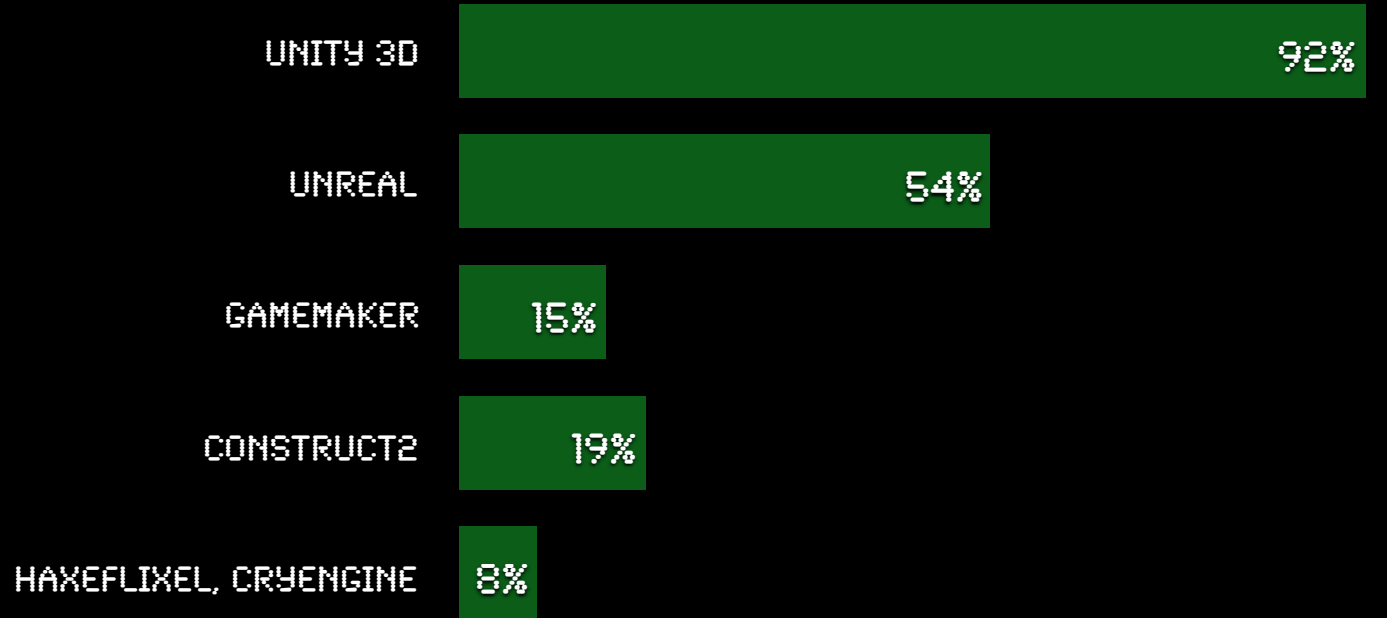
UNITY AT GDC 2015

WHAT ENGINES DO YOUR STUDENTS USE?



■ UNDERGRADUATE PROGRAMS WITH STUDENTS USING A PARTICULAR ENGINE (N=30)

WHAT ENGINES DO PROGRAMS PROVIDE INSTRUCTION FOR?



■ UNDERGRADUATE PROGRAMS WITH EXPLICIT INSTRUCTION FOR AN ENGINE (N=30)

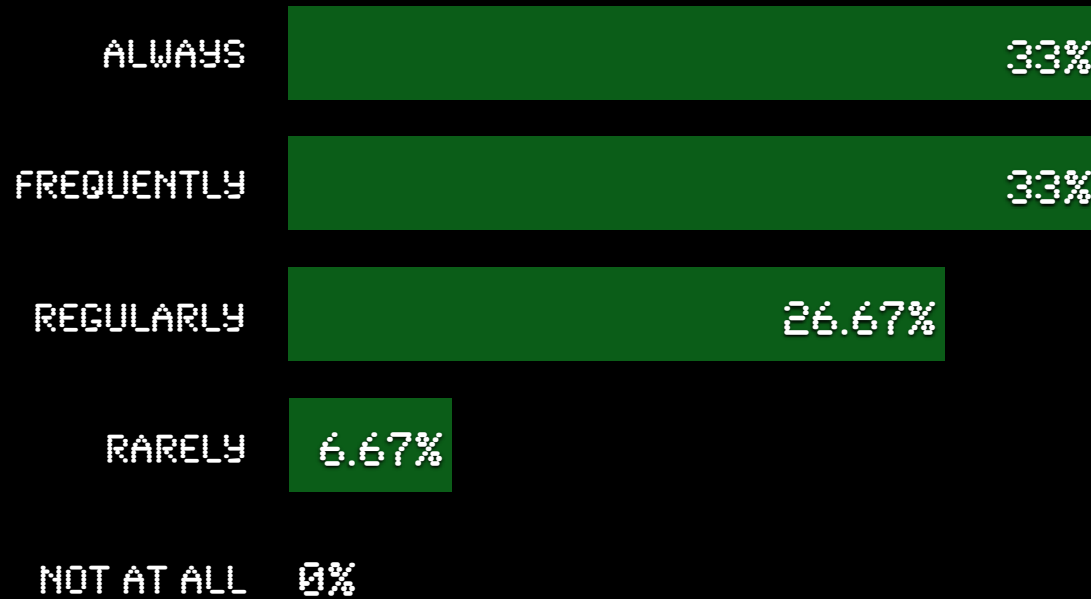
MAKE OUR STATS BETTER!

**[HTTP://BIT.LY/
HEVGA_ENGINE_SURVEY](http://bit.ly/HEVGA_ENGINE_SURVEY)**

[G2] MACHINES OF LOVING GRACE

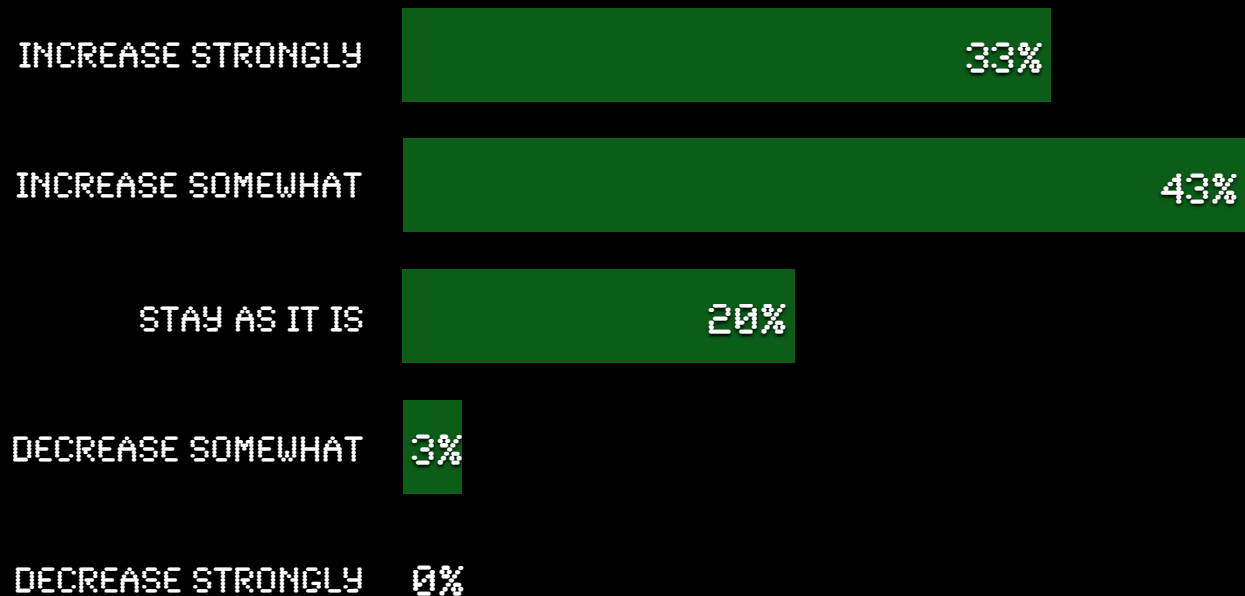
*JUST WHAT IS IT THAT MAKES TODAY'S GAME ENGINES SO
DIFFERENT, SO APPEALING?*

HOW SOUGHT-AFTER IS EXPERIENCE WITH GAME ENGINES BY GAME COMPANIES HIRING YOUR GRADUATES?



UNIVERSITIES OFFERING AN UNDERGRADUATE PROGRAM (N=30)

HOW WILL INDUSTRY DEMAND EVOLVE IN THE NEXT 5 YEARS?



UNIVERSITIES OFFERING AN UNDERGRADUATE PROGRAM (N=30)

ADVANTAGES OF GAME ENGINES

- *"Employability!" They fit industry needs, especially for indies*
- *They free up time spent on low-level programming for learning and doing game and level design, polish*
- *Students build a portfolio of more and more polished games*
- *They let everyone prototype quickly*
- *They allow buildup and transfer of a defined skill, learning how disciplines work together along pipelines*
- *One tool for all classes is easier to teach, run, and service*



"OUR UNIFICATION OF THOUGHTS IS MORE POWERFUL
A WEAPON THAN ANY FLEET OR ARMY ON EARTH."

[Q3] THE MACHINE STOPS

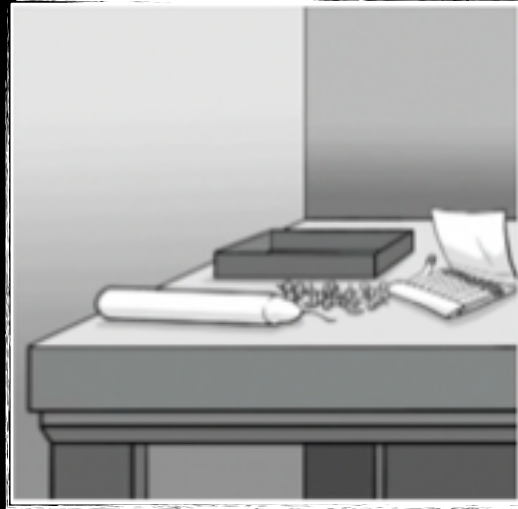
ISSUES – AND SOLUTIONS

1. THINKING INSIDE THE TOOL BOX

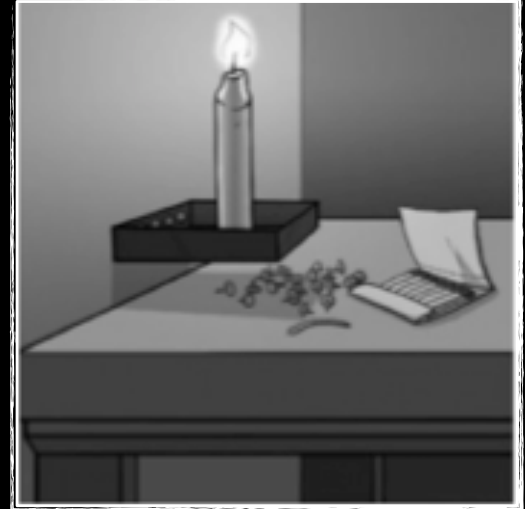
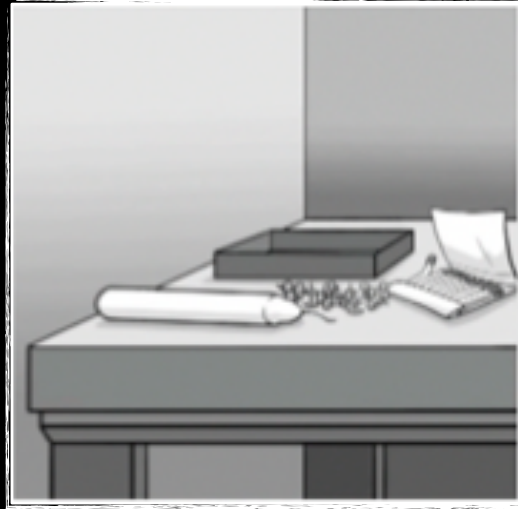
1. THINKING INSIDE THE TOOL BOX



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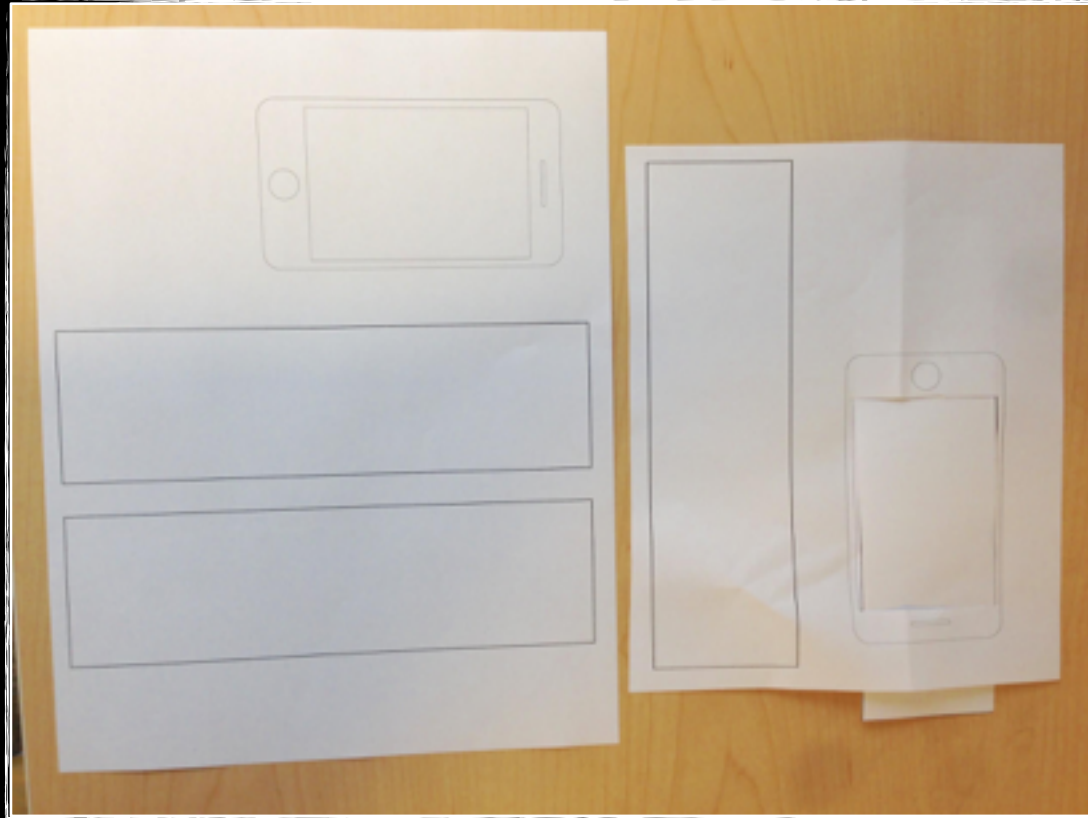


1. THINKING INSIDE THE TOOL BOX



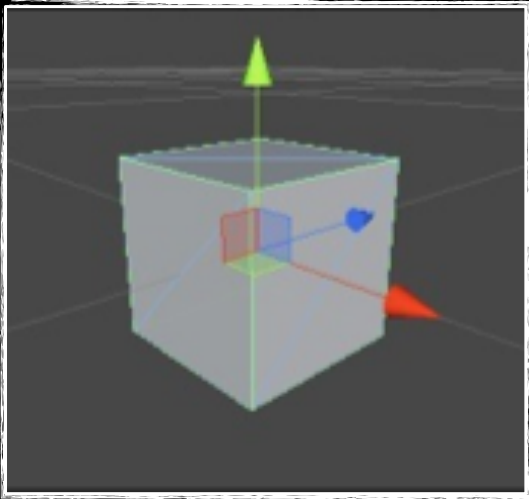
**THE TOOLS WE USE SHAPE
THE PROBLEMS AND SOLUTIONS WE SEE**

EXAMPLE: DEATH BY LACK OF PAPER CUTS



EXAMPLE: PROTOTYPING TOOLS SHAPE RESULTING GAMES

EXAMPLE: PROTOTYPING TOOLS SHAPE RESULTING GAMES

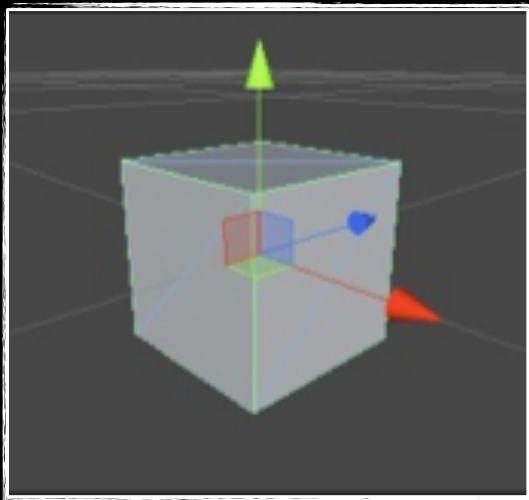


UNITY 3D

Navigating physical world

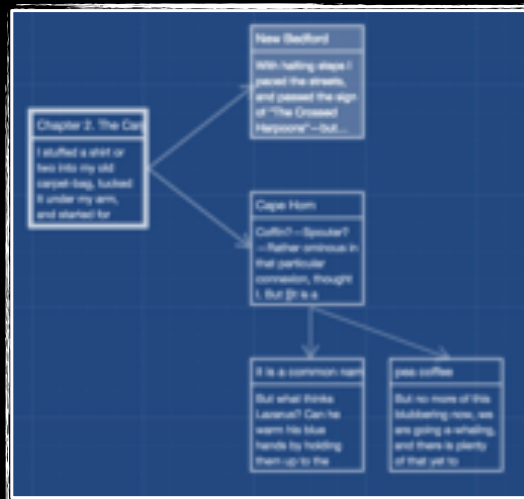
Action, shooter, platformer

EXAMPLE: PROTOTYPING TOOLS SHAPE RESULTING GAMES



UNITY 3D

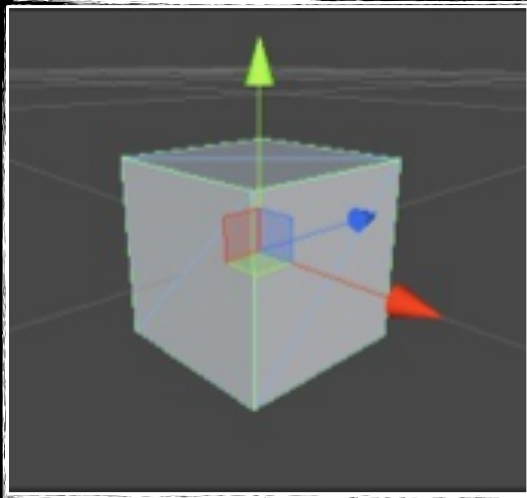
Navigating physical world
Action, shooter, platformer



TWINE

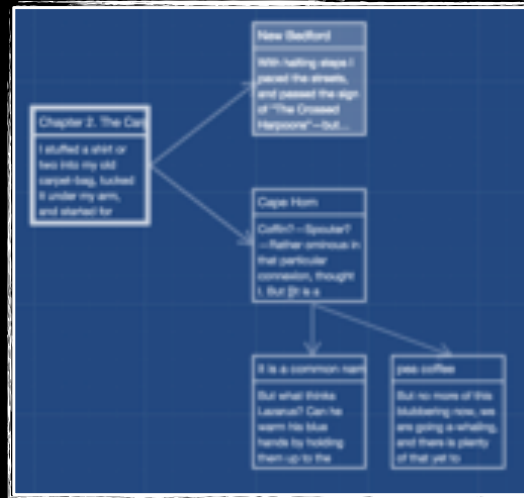
Traversing decision tree
Adventure, puzzle, dialogue

EXAMPLE: PROTOTYPING TOOLS SHAPE RESULTING GAMES



UNITY 3D

Navigating physical world
Action, shooter, platformer



TWINE

Traversing decision tree
Adventure, puzzle, dialogue

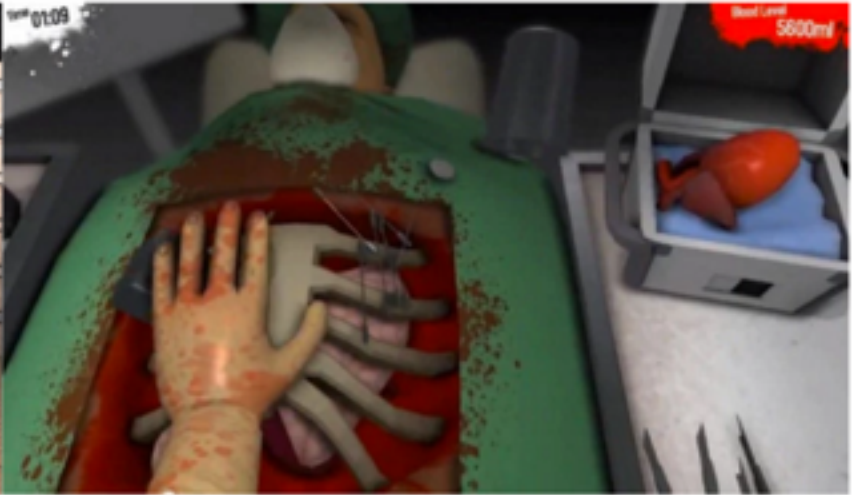
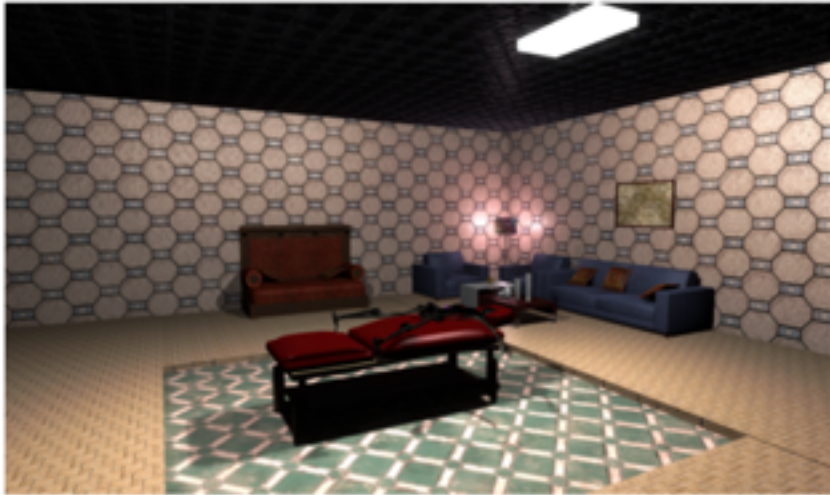


MACHINATIONS

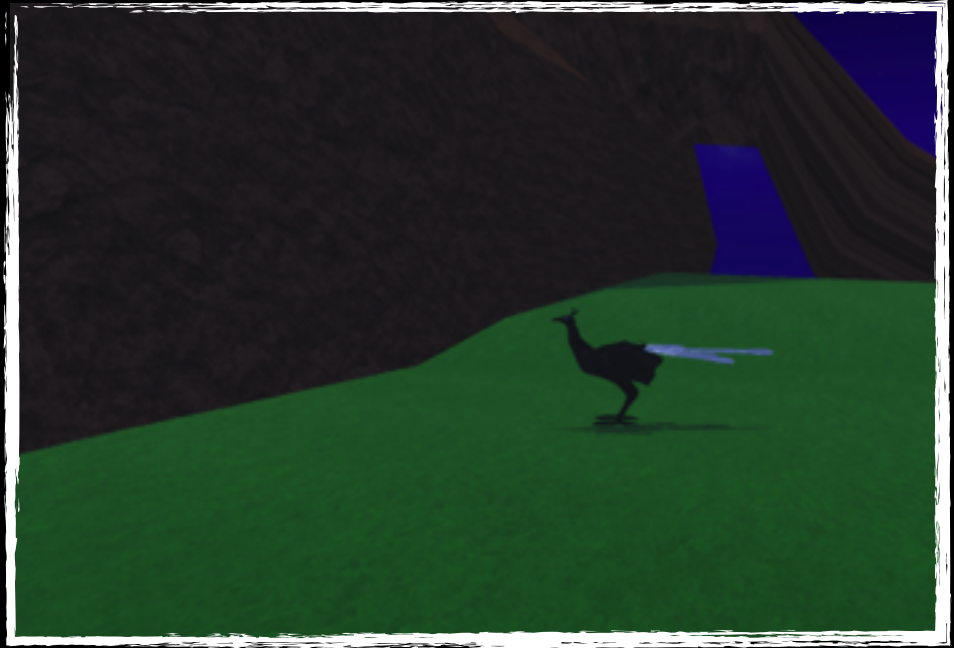
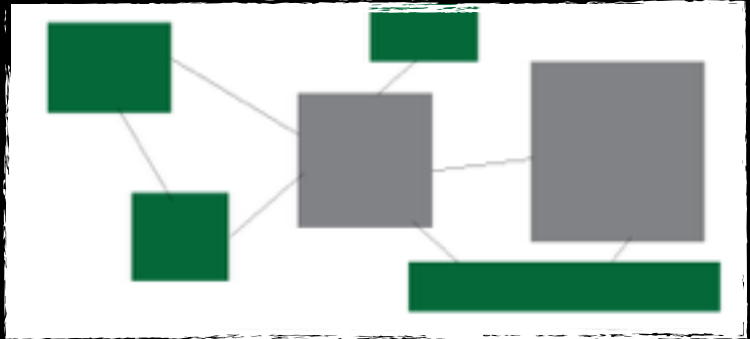
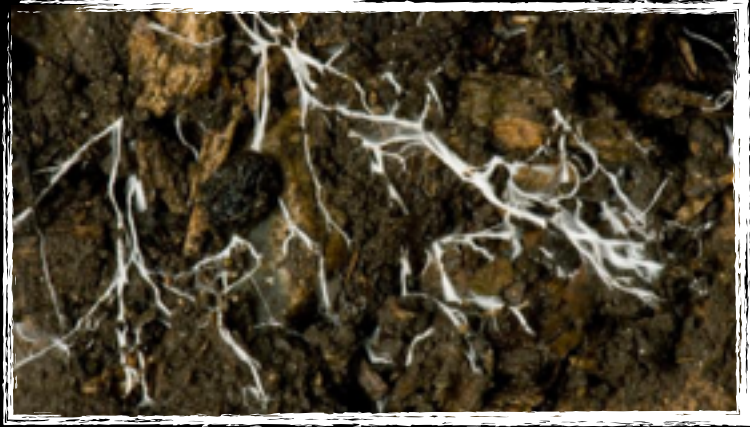
Configuring dynamic system
Simulation, strategy

2. ENGINE ON, HEAD OFF


Art Style



THE LURE OF THE OVERSCOPE



TOOL KNOW-HOW \neq CRAFTSMANSHIP & ARTISTRY

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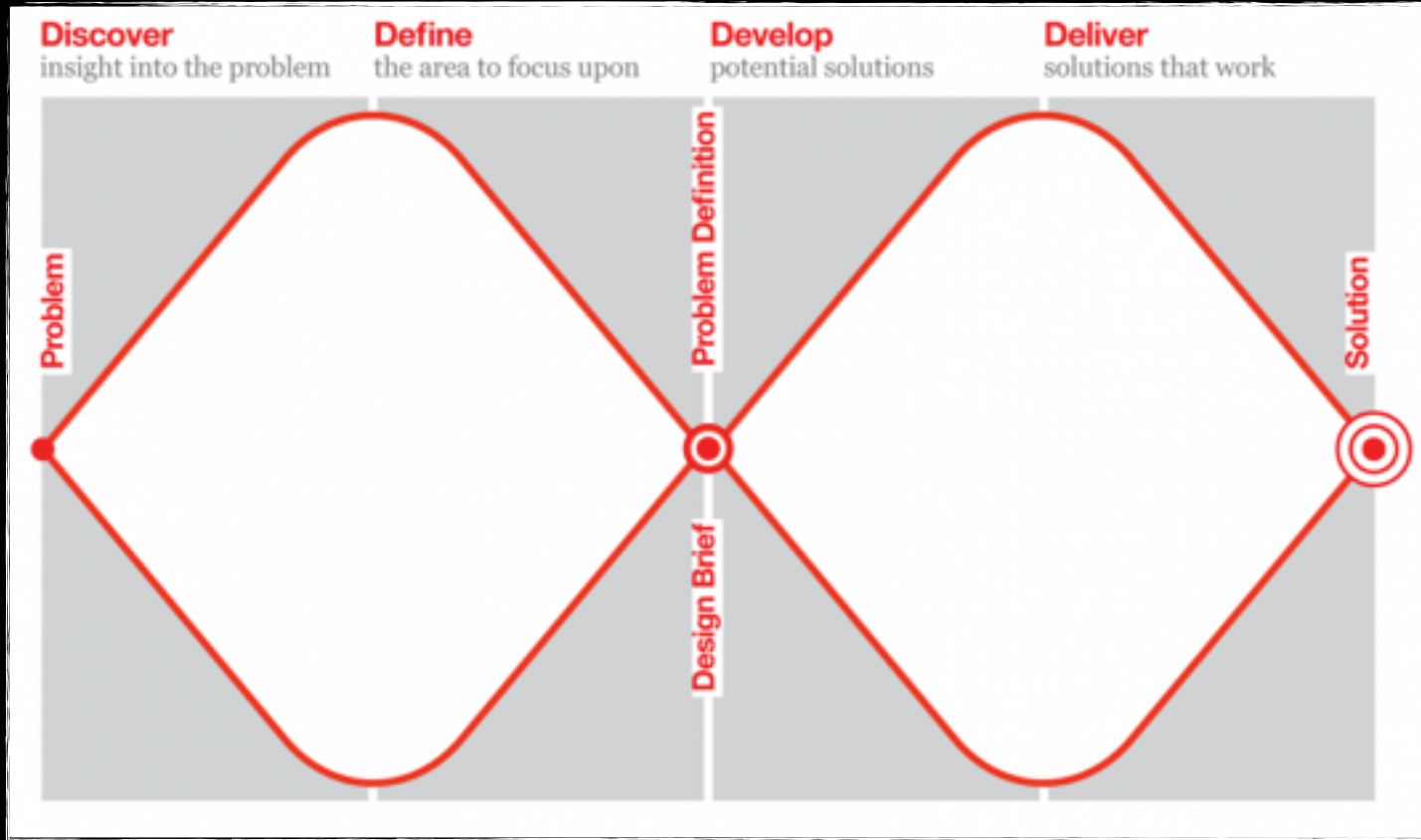
Lectures	73
Video	9 Hours
Skill Level	All Levels
Languages	English, captions
Includes	Lifetime access 30 day money back guarantee! Available on iOS and Android Certificate of Completion

 [Wishlist](#)

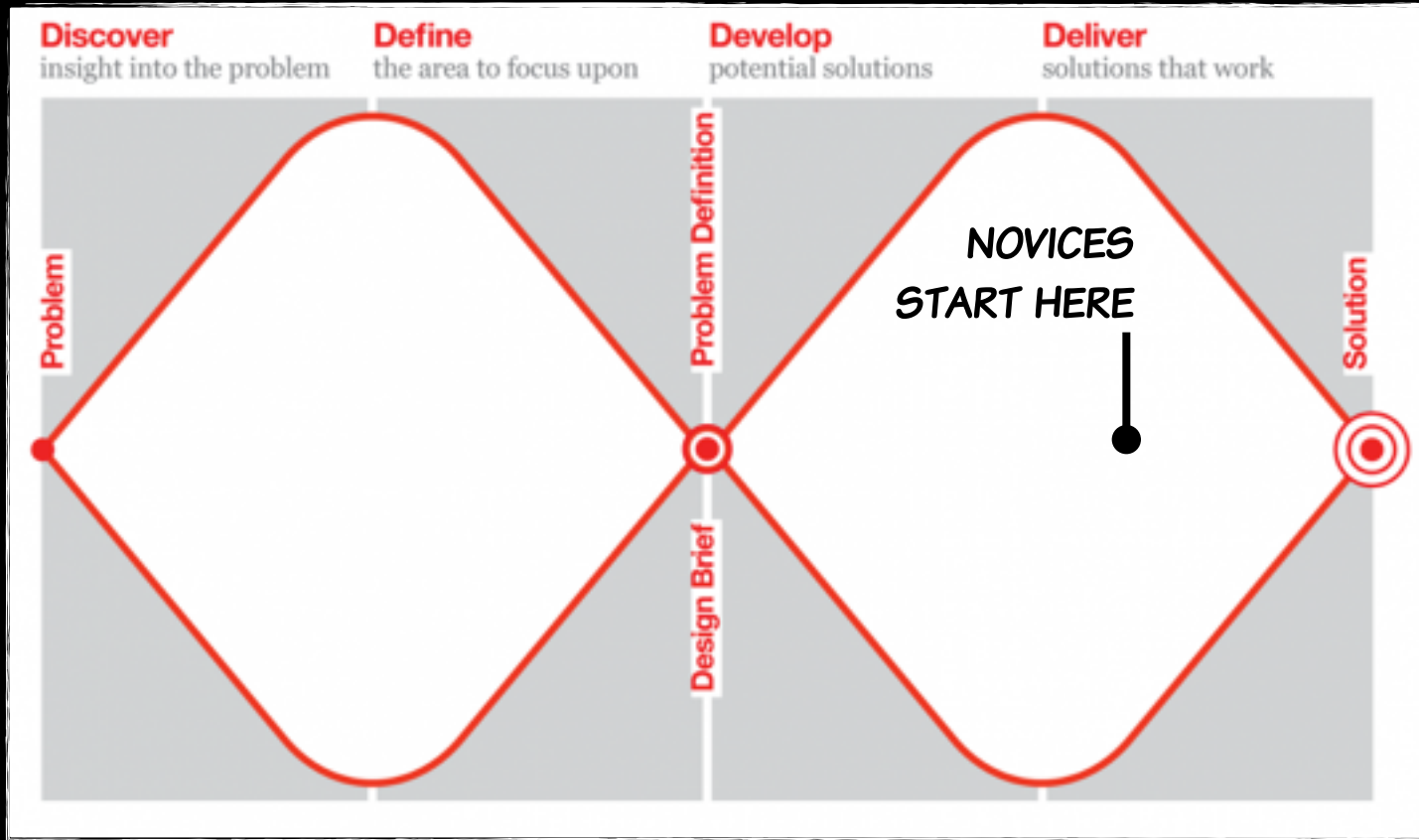
How taking a course works

*GOOD DESIGNERS SEE, PROBE, QUESTION,
REJECT, REDO, CREATE PROBLEM FRAMINGS*

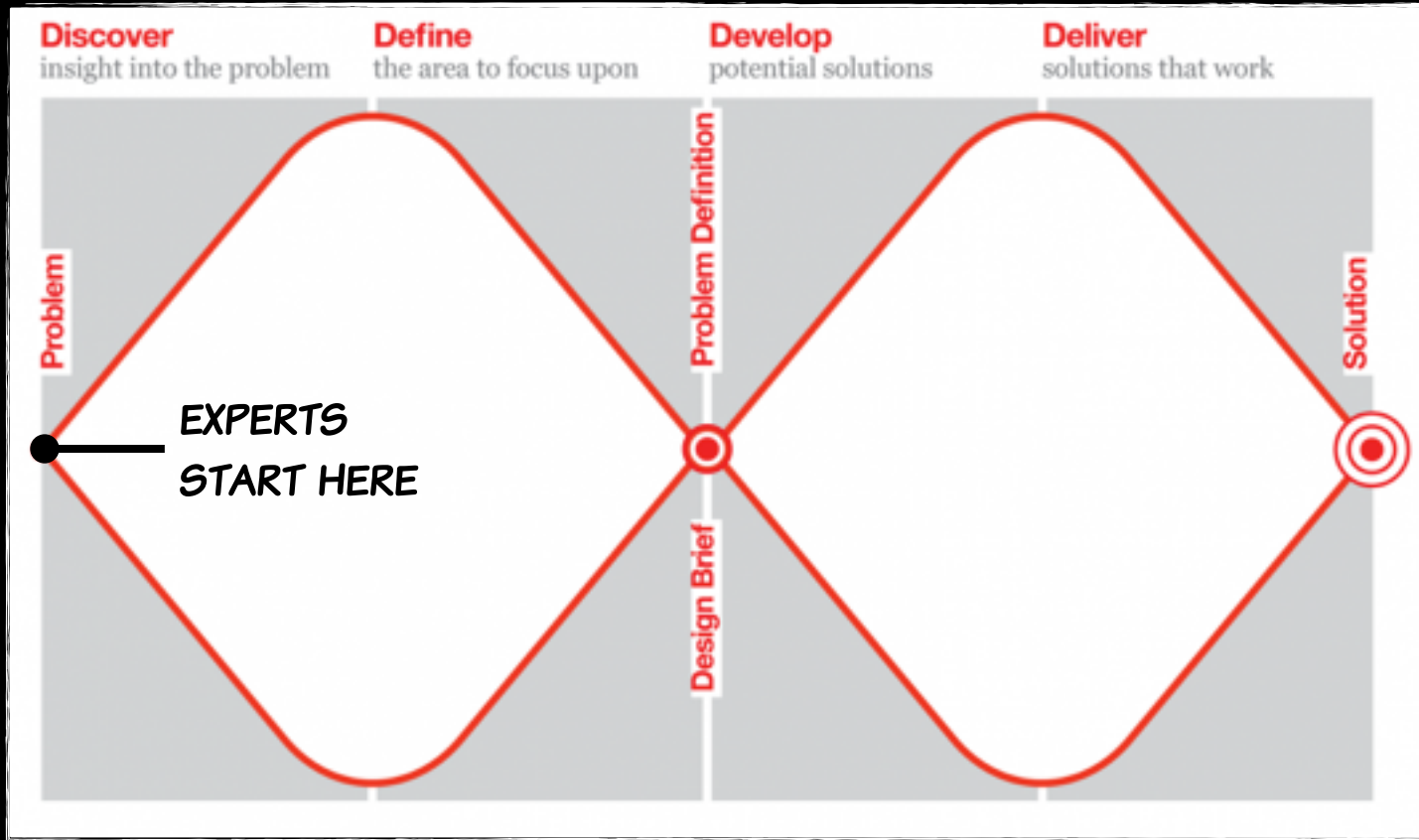
THE DOUBLE DIAMOND OF DESIGN



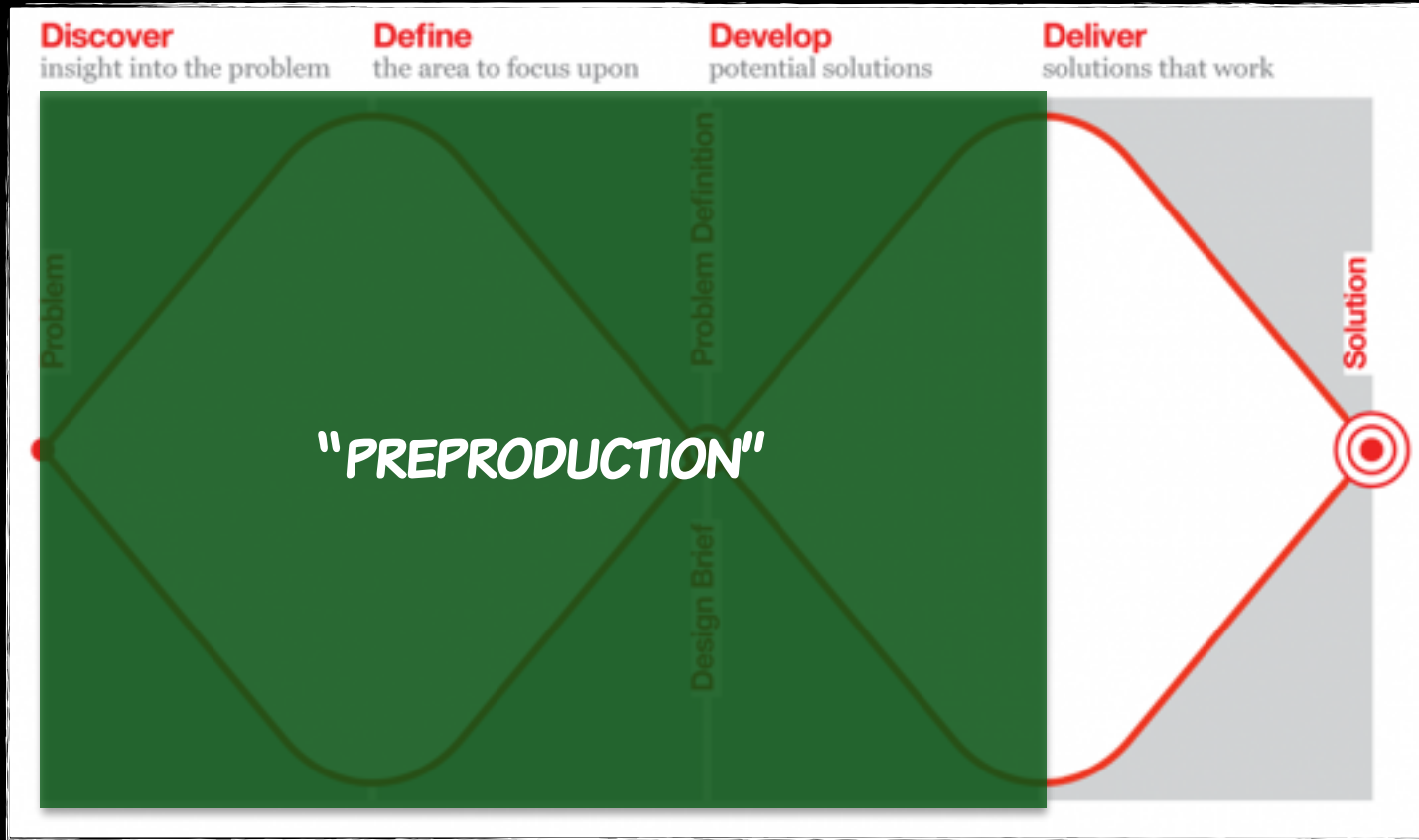
THE DOUBLE DIAMOND OF DESIGN



THE DOUBLE DIAMOND OF DESIGN



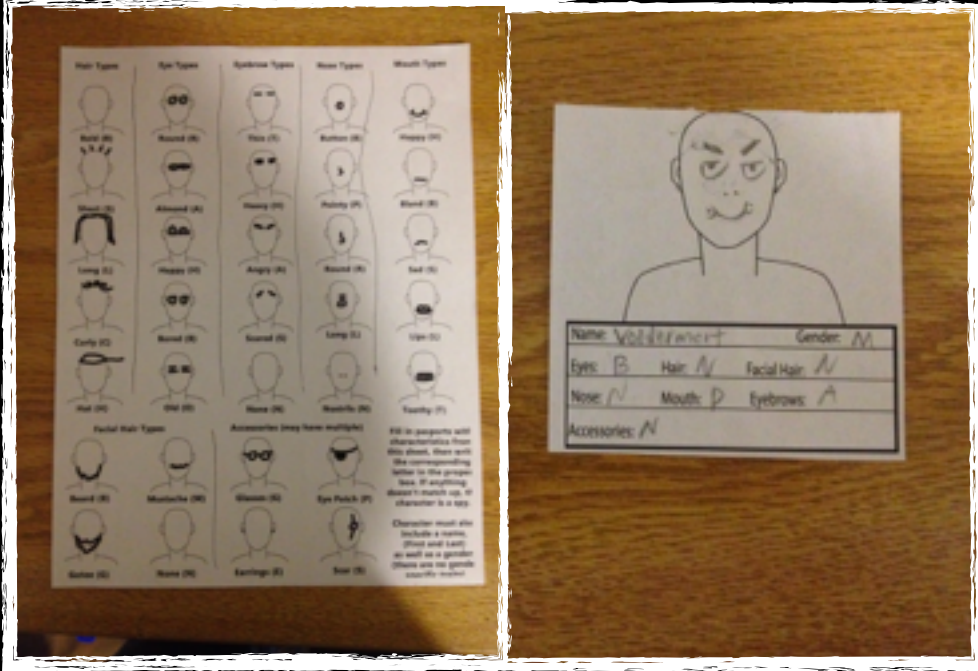
SOLUTION: EXPLICITLY TEACH THE FULL DESIGN PROCESS



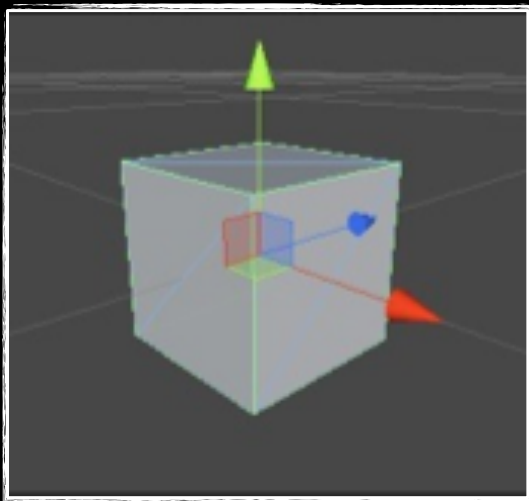
SOLUTION: TEACH, GRADE "FEELING FIRST"



SOLUTION: START WITH OFF-TOOL PROTOTYPE, ART SKETCHES



SOLUTION: EXPOSE STUDENTS TO MULTIPLE OPERATIONAL LOGICS



UNITY 3D

Navigating physical world

Action, shooter, platformer



TWINE

Traversing decision tree
Adventure, puzzle, dialogue



MACHINATIONS

Configuring dynamic system

Simulation, strategy

SOLUTION: EXPOSE STUDENTS TO MULTIPLE OPERATIONAL LOGICS



DOOM

Navigating physical world
Action, shooter, platformer



80 DAYS

Traversing decision tree
Adventure, puzzle, dialogue



NETRUNNER

Configuring dynamic system
Simulation, strategy

3. PREFABRICATION LIMITS CONTROL & QUALITY





Asher Vollmer @AsherVo · 23 Jul 2015

Hi my name is Asher and I'm not using Unity's built in UI for my super-UI heavy game hello.



14



Asher Vollmer

@AsherVo



Following

I'm following my rule of not trusting unity's big black boxes (physics, lighting, UI, AI) for core elements of a game.

RETWEETS

2

LIKES

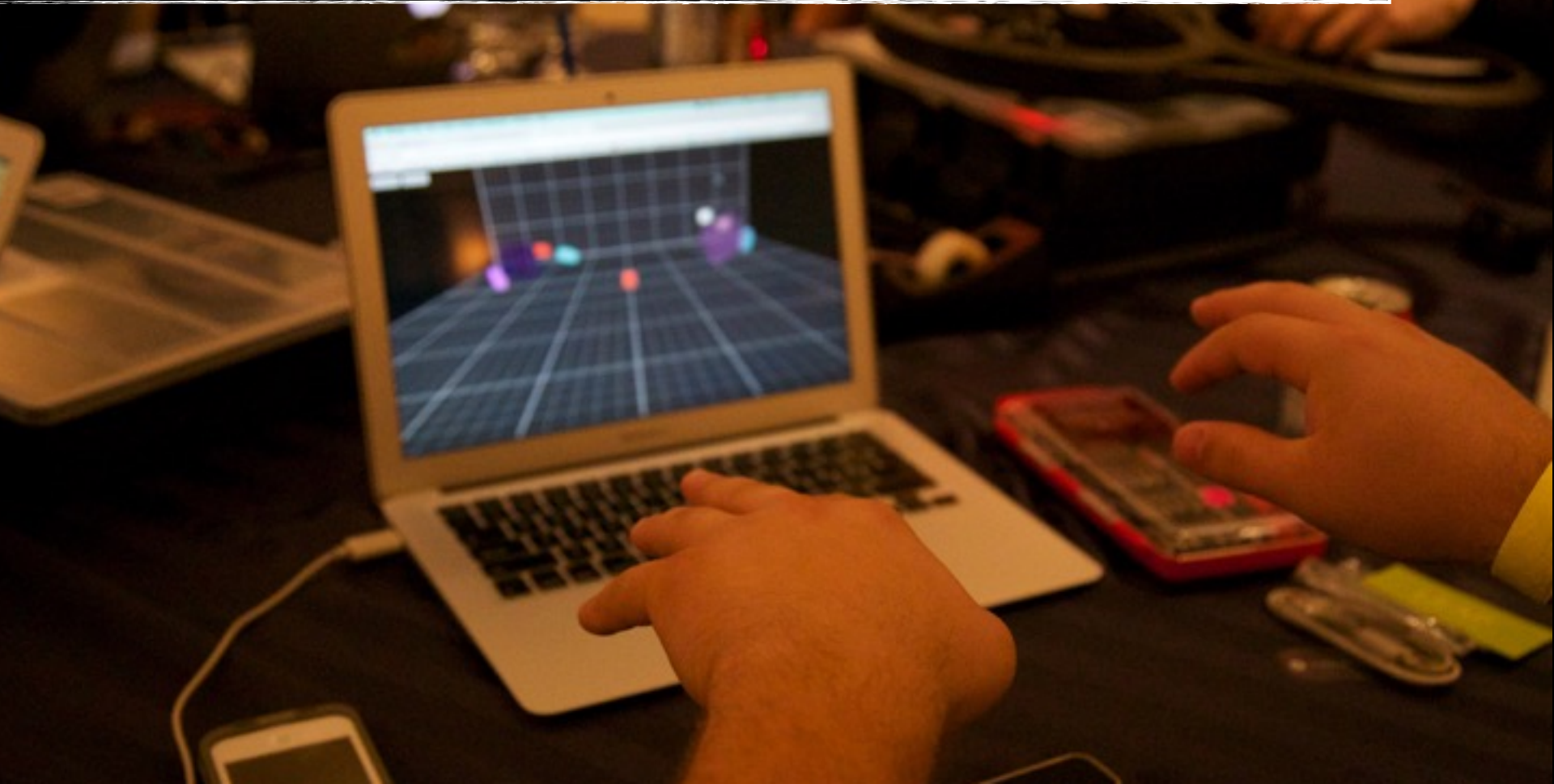
14



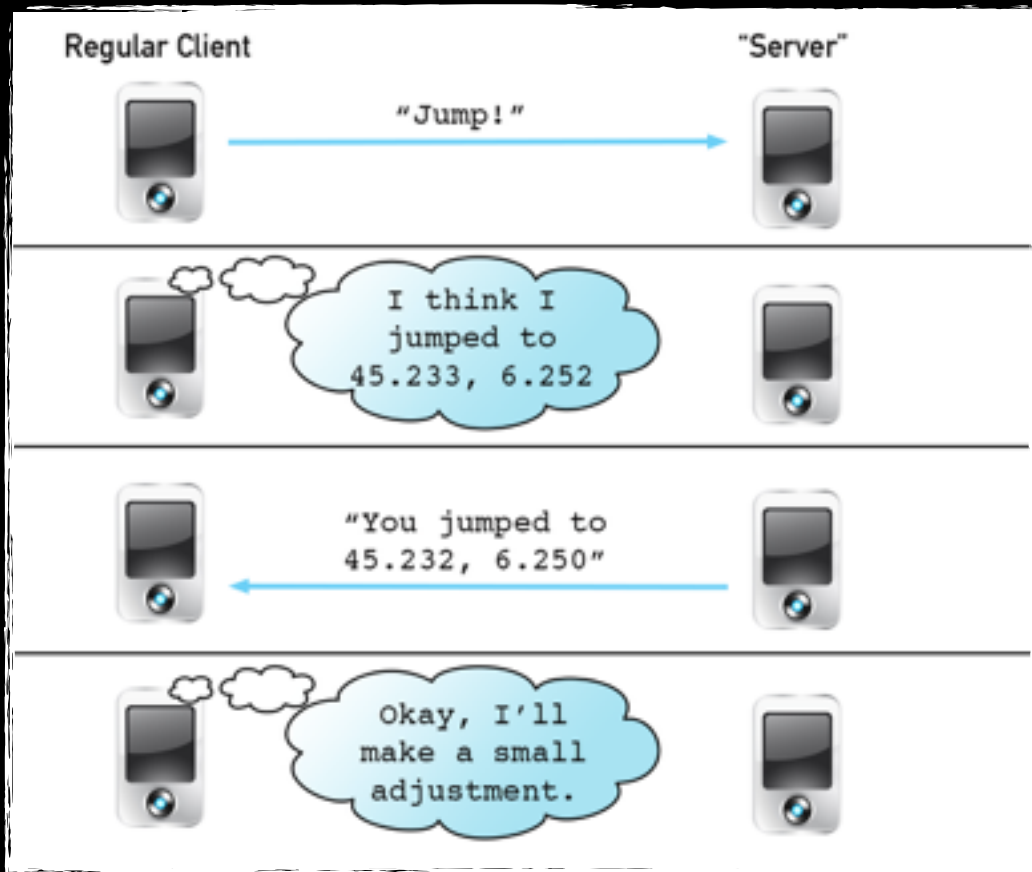
1:12 PM - 23 Jul 2015



LESS FEATURES, LESS DETAIL CONTROL, MORE REFACTORING WORK



LESS DEEP UNDERSTANDING = LOWER QUALITY, MORE BUGS



SOLUTION: TEACH AND PRACTICE TECH RESEARCH & PROTOTYPING



SOLUTION: PROGRAM YOUR OWN EXTENSION AS EXPLICIT ASSIGNMENT

Search...
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ToyCar Game StarterKit

Category: Complete Projects
Publisher: Daniel Copper
Rating: ★★★★★ (17)
Price: \$6.25

Requires Unity 4.7.0 or higher.

Have fun Cruising Around

- imaginably use it as a springboard to your own little car game, or simply as an inspiration tool. Featuring:
- Fully editable within Unity
- Three different car types
- Automatic driving on streets
- Individual drive behavior
- Wheel animation
- Following camera
- Onscreen Speedometer and Wheel
- Double-touch control support
- Dynamic ground decoration
- Mobile-friendly blocky polystyle
- Car exhaust Smoke
- Simple Scoring

- ★ Home
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04:37:01

24 HOUR

CAR

UBER - Standard Shader ...
\$30 \$50

PC & MOBILE

ProChart

Asset Store

GameStrap UI

60+ Icons 70+ shapes Tool Kit

NEW ON #ASSETSTORE

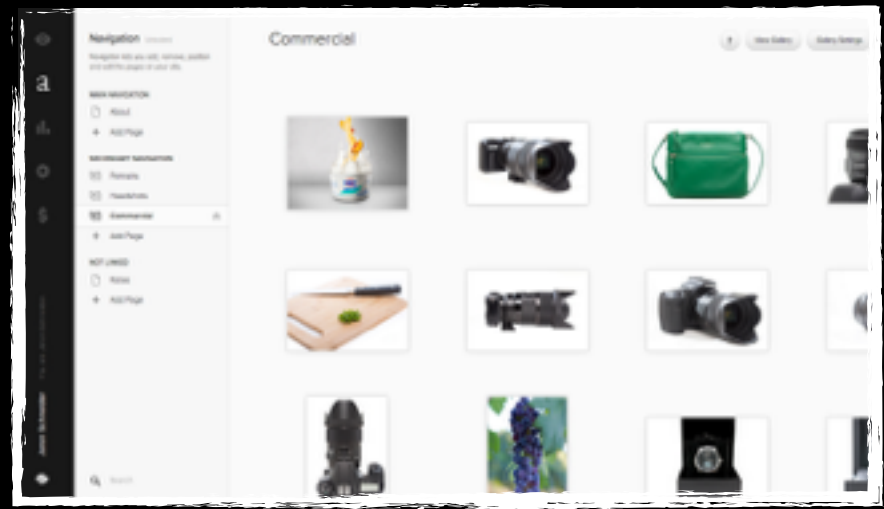
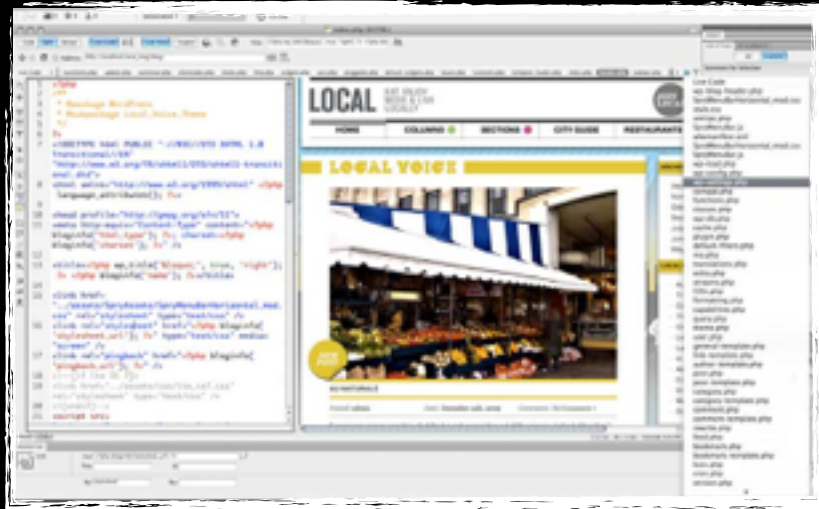
SOLUTION: HAND-CODE PROOF OF CONCEPTS BEFORE USING PREFAB



4. TRANSIENCE OF TOOLS



LIMITED DEPTH AND TRANSFER-ABILITY = LIMITED RE-EMPLOYABILITY



WHAT CRAFTSPERSONS NEED IN ANY FIELD

- *Fluency in one current tool environment*
- *Ability to learn, explore, exploit new tools*
- *Lasting technical fundamentals of their craft*
- *Lasting aesthetic compass and map of their craft*

SOLUTION: TEACH CS/GAME PROGRAMMING FUNDAMENTALS



SOLUTION: TEACH AESTHETIC PRINCIPLES WITH TOOLS

**"ALL TOOLS, FROM ACRYLICS TO UNITY,
SHOULD HAVE THEORY ACCOMPANYING THEM"**

SOLUTION: TEACH AESTHETIC PRINCIPLES WITH TOOLS



**BROUGHT
TO YOU BY**



SOLUTION: CORE COURSE, SHIFTING TOOLS ADD-ONS & BOOTCAMPS

PRINCIPLES OF SCULPTURE

4 credit hours

Main course

Stable

+ TOOLS COURSE

1 credit hour

catch-up/check-in

Changes with tools

5. MONEY & POWER

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UNITY PRO AND UNITY PERSONAL SOFTWARE LICENSE AGREEMENT 5.X

Last updated: October 7, 2015

SUMMARY OF IMPORTANT USE RESTRICTIONS

Please Read the Entire Agreement and Definitions Below

Scope of License

This Software License Agreement governs your use of the Software. Depending upon your requirements and circumstances, you will be permitted to use either Unity Pro or Unity Personal (formerly known as Unity Free). This Software License Agreement governs use of both Unity Pro and Unity Personal.

Primary Differences Between Unity Pro and Unity Personal

Although Unity Personal has most of the features and functionality that Unity Pro has, Unity Personal: (a) includes certain features that cannot be disabled when your application is launched, including a Unity branded startup screen and certain analytics data collection; (b) does not provide team collaboration functionality; and (c) users will be required to complete a user survey to activate the Software. Unity Pro users who are not eligible to use Unity Personal may not develop and publish Licensee Content for the iOS and Android platforms without purchasing the applicable Unity Pro Add-On Product license. Unity may monitor your compliance with and enforce these restrictions and requirements including but not limited to monitoring the number of downloads of your Licensee Content and any available revenue estimate data.

Which Version You Can Use - Unity Personal Revenue Restrictions

Except for a thirty (30) day trial period, Unity Personal (including the iOS and Android platform deployment options) may not be used by:

1. a Commercial Entity that has either: (a) reached annual gross revenues in excess of US\$100,000, or (b) raised funds (including but not limited to crowdfunding) in excess of US\$100,000, in each case during the most recently completed fiscal year;

QUICK JUMP

- [Summary of Important Use Restrictions](#)
- [UNITY SOFTWARE LICENSE AGREEMENT 5.x](#)

CLASSIC MARKET CAPTURE THROUGH LOCK-IN OF PLATFORM BUSINESSES

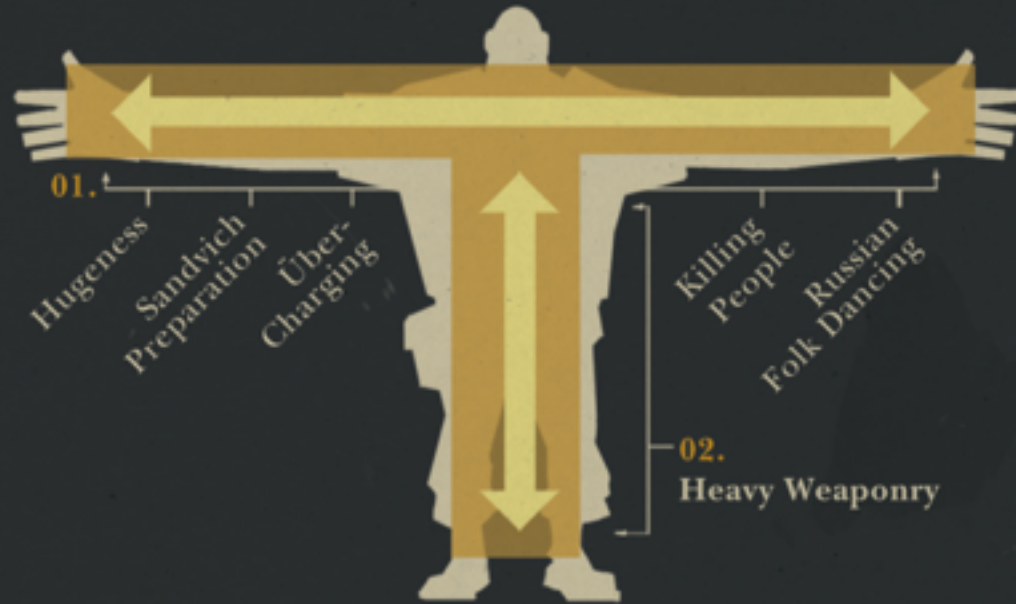


[04] THE WALKING T

CONCLUSIONS

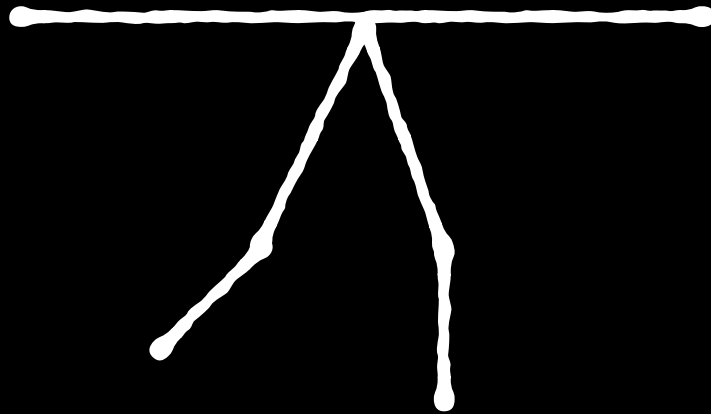
EDUCATING T-SHAPED PRACTITIONERS?

T-SHAPED MODEL: EMPLOYEE



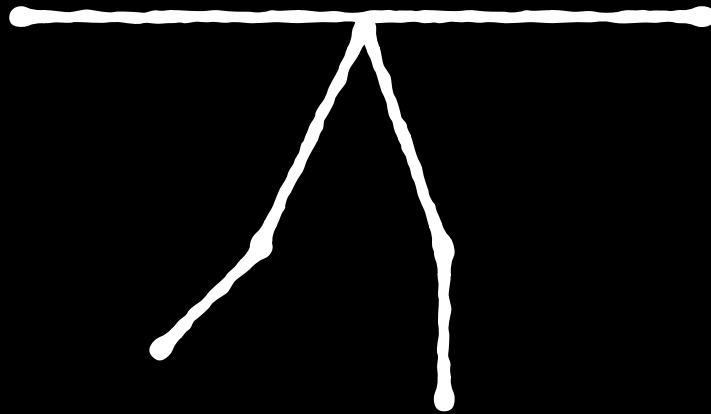
01. Broad-range generalist **02. Deep expertise in one area**

EDUCATING WALKING Ts!



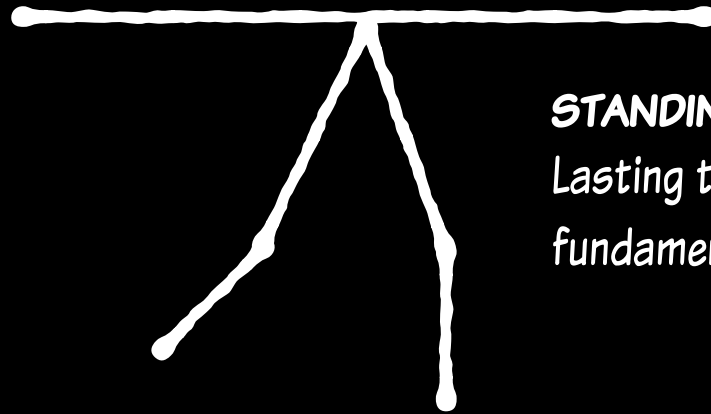
EDUCATING WALKING Ts!

BROAD-RANGE KNOWLEDGE OF TOOLS



EDUCATING WALKING Ts!

BROAD-RANGE KNOWLEDGE OF TOOLS



STANDING LEG

*Lasting tech & aesthetic
fundamentals*

EDUCATING WALKING Ts!

BROAD-RANGE KNOWLEDGE OF TOOLS

PLAY LEG
Up-to-date
tool know-how

STANDING LEG
Lasting tech & aesthetic
fundamentals



QUESTIONS?

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CASEY O'DONNELL m: caseyod@msu.edu t: @caseyodonnell

TAKE THE SURVEY! http://bit.ly/hevga_engine_survey