

Background Image

References:

Pinterest, 2016. AI Brain. Image. Pinterest. Available from: <https://www.pinterest.com/pin/112378953182466339/> [Accessed 15 May 2017].

Unreal AI Tools

References:

Broder, D., 2014. Blackboard Documentation. Unreal Engine Formums. 04 March 2014. Available from:

<https://forums.unrealengine.com/showthread.php?2004-Blackboard-Documentation> [Accessed 11 May 2017].

Epic Games, 2017. How Unreal Engine 4 Behavior Trees Differ. Epic Games Website, Available from:

<https://docs.unrealengine.com/latest/INT/Engine/AI/BehaviorTrees/HowUE4BehaviorTreesDiffer/index.html> [Accessed 4 May 2017].

Epic Games, 2017. Behavior Trees Nodes Reference. Epic Games Website, Available from:

<https://docs.unrealengine.com/latest/INT/Engine/AI/BehaviorTrees/NodeReference/index.html> [Accessed 5 May 2017].

Notes:

- *Behaviour Tree (Thinking)*
- *Blackboard (Memory)*
- *Waypoints (Destinations)*
- *Nav mesh (Traversable area)*

Flocking

References:

Reynolds, C., 2001. Boids. Red3D, Available from: <http://www.red3d.com/cwr/boids/> [Accessed 8 May 2017].

Notes:

- *Craig Reynolds 1986*
- *Simulation of animal flocking*
- *Shared mindset*
- *Collision/Direction/Cohesion*
- *Area of to be effected by data*

Fuzzy Logic

References:

Math Works, 2017. Foundations of Fuzzy Logic. MathWorks, Available from:

<https://uk.mathworks.com/help/fuzzy/foundations-of-fuzzy-logic.html> [Accessed 9 May 2017].

Notes:

- *Lotfi A Zadeh 1965*

- *If else statements*
- *Not true or false.*
- *Fuzzy sets (Degrees of truths) between logics*
- *Sense current environment conditions*
- *Acts on then*
- *Then can introduce Logical Operators to include OR, NOR etc.*

Path Finding

References:

Imms, D., 2012. A* pathfinding algorithm. Growing with the Web. 28 May 2016. Available from: <http://www.growingwiththeweb.com/2012/06/a-pathfinding-algorithm.html> [Accessed 10 May 2017].

Notes:

- *Finds shortest path*
- *A* uses heuristics to increase speed of algorithm*
- *Dijkstra examines candidate nodes*
- *Remembers where it's been so it knows where to go.*

Behaviour Trees

References:

Simpson, C., 2014. Behavior trees for AI: How they work. Gamasutra. 17 June 2014. Available from:

http://www.gamasutra.com/blogs/ChrisSimpson/20140717/221339/Behavior_trees_for_AI_How_they_work.php [Accessed 5 May 2017].

Mars, C., 2015. BT 101 - Behaviour Tree Basics. Craft AI. 24 June 2015. Available from: <http://www.craft.ai/blog/bt-101-behavior-trees-grammar-basics/> [Accessed 2 May 2017].

Colledanchise, M. and Ogren, P., 2016. How Behavior Trees Modularize Hybrid Control Systems and Generalize Sequential Behavior Compositions, the Subsumption Architecture and Decision Trees. TRANSACTIONS ON ROBOTICS, Available from: <http://michelecolledanchise.com/tro16colledanchise.pdf> [Accessed 2 May 2017].

Pereira, R., 2014. An Introduction to Behavior Trees – Part 3. Artificial Intelligence. 15 August 2014. Available from:

<http://blog.renatopp.com/2014/08/15/an-introduction-to-behavior-trees-part-3/> [Accessed 4 May 2017].

Notes:

- *Type of Finite state machine*
- *No Parent = Root*
- *No child = Leaves*
- *Branches in between, traversed based on conditions*
- *Selectors*
 - *Any tasks complete*
 - *Remaining not carried out*

- *Running when task undergoing*
-
- *Sequence*
 - *All tasks need to be complete*
 - *False if any are not complete*
 - *Will run in order*
- *Parallel (task can run in parallel)*
- *Good for LOD AI*

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References:

Tutorials Point, 2017. Artificial Intelligence - Neural Networks. Tutorials point, Available from: https://www.tutorialspoint.com/artificial_intelligence/artificial_intelligence_neural_networks.htm

[Accessed 11 May 2017].

Notes:

- *Complex implementation*
- *Works like the human brain*
- *Uses synapses to compute and send data.*
- *Input is conditional and environmental variables.*
- *Will be adjusted by weights.*
- *Starts off with some "Training" data.*
- *Works and learns to get the best output.*

Sensors

Notes:

- *Uses sensors in 3 directions*
- *Navigates and learns*
- *Changes weighting of suggested path depending on success*
- *Will eventually learn the entire track.*
- *Won't be able to compensate for player at all times.*

Finite State Machines

Notes

- *Way of controlling AI in deterministic way*
- *Works like a flow chart*
- *Randomness introduced by random variables*
- *Simple method of decision making.*
- *Decisions are based on input from external environments and internal knowledge.*

A1

594 x 841 mm

23.4 x 33.1 in

Key Words:

Blackboard (BB) - AI Memory

Behaviour Tree (BT) - "Brain"

Data Driven (BB)

Event Driven (BT)