<http://dictionary.sensagent.com/Fog%20of%20war/en-en/#Grand_strategic>

<https://en.wikipedia.org/wiki/Wargaming#Early_years_to_Kriegsspiel>

<https://www.giantbomb.com/fog-of-war/3015-14/>

http://dictionary.sensagent.com/Kriegsspiel%20(wargame)/en-en/

https://www.amazon.com/War-Made-New-Weapons-Warriors/dp/1592403158

<https://archive.org/details/Tanktics_1981_Avalon_Hill>

Fog of War:

0.Introduction:

Fog of war is a common concept found in many combat-based real-time and turn-based strategy games. It simulates the unknowns of the battle and provides an exploration incentive to uncover them, forcing the player to rely on imperfect and incomplete information of the battlefield and sometimes improvise based on intuition and common sense.

In this document we are going to talk about the concept of the Fog of War and all its variables, the origins, how board games and videogames adapt the concept to engage the user, and finally a tutorial of how to do a fog of war for an RTS game.

1.Concept:

The **fog of war** is a term used to describe the uncertainty in the situation experienced by participants in military operations. The fog of war isn’t limited at the own capability, so it determinates the adversary capability too.

So fog of war is directly related with the fog in a real battle camp and the ambiguity that it generates, but when this concept is transferred to the world of games is not necessary simulated with fog. For example, in Battleship the famous board game there’s no fog but the concept of war ambiguity is present, in fact, is the principal feature of the game.

[Battleship foto]

In videogames is practically the same. It’s true that a lot of videogames simulate the fog of war concept directly with fog but some videogames use other methods. For example, BRAIN / OUT is a shooter that simulates the war ambiguity hiding the players that aren’t doing noisy actions.

[BRAIN / OUT foto]

Now that we know what really means Fog of War let’s talk about the different ways in which the ambiguity can affect the user and change the game flow.

1.2 Types:

The ambiguity that the fog of war generates can vary according to the level at which participants are engaged. The different ambiguity levels are:

* Grand Strategic:

Ambiguity is related to the political intent, capabilities and logistical strengths of an adversary. Basically we know that there’s an adversary but we don’t know nothing about it. [Age of Empires develop]

* Military Strategic:

Ambiguity is related to the structure, strength, capability, and disposition of own and adversary offensive and defensive assets. The own assets ambiguity can be generated by a bad report of it or unwillingness to watch for them. [Cod Hardcore develop]

* Operational:

Ambiguity is related with the adversary like the grand strategic but is coupled with own directive ambiguity. So the commander doesn’t have the full sight of the strategic imperative. [Dragons of Atlantis develop]

* Tactical:

In this case the ambiguity is around several factors at the tactical level. The ambiguity can be related with the interaction between allied troops, their status and their intentions. This lack of comprehension of the tactical environment by the commander aren’t necessary generated by factors inherent to battle. [??? develop]

2.Origins:

Okay, we have seen all the different features of the fog of war and which mechanics use the games to adapt the concept. But who was the first person that thinks that use fog of war in a game should be a good idea?

The first board game that uses fog of war was Kriegsspiel, that means wargame in German. This game was created by Lieutenant von Reisswitz in 1824 for training officers of the Prussian army. The invent that Lieutenant craft wasn’t directed only for playing but is considered the grandfather of modern wargames because he established several conventions for wargaming.

[Kriegsspiel photo]

Getting closer to today and entering to the digital era, we have Tanktics. The first digital war-game created in 1977 by Chris Crawford’s and published for Commodore PET in 1978. The game simulates a two-player tank battle on a hex grid. This was the first videogame that uses fog of war and for that was criticized. The fog of war in Tanktics generates a Military Strategic ambiguity because the game don’t show the enemy coordinates since your tanks don’t see it.

[Tanktics photo & explain data]

3.Lets craft our fog of war:

Now we are experts of fog of war so let’s craft our fog of war for an RTS.

This tutorial of how to make a basic fog of war for a RTS is focused to people that knows the basic concepts of c/c++ programming.

First we download the base code from this “link” where there’s also a release with the final result of the tutorial. We have the material so let’s start the work!

TODO 1: Create fog layer (alpha layer already created)

TODO 2: Map optimization

TODO 3: Entities optimization

TODO 4: Paint alpha layer

TODO 5: Ally clear alpha layer

TODO 6: Neutral detected clear area

TODO 7: Update alpha layer

TODO 8: Smooth