**How to survive a medieval battle**

Using statistics and an over simplified model

Introduction:

**Motivation:**

Fighting each other with swords, spears, bows and arrows, in pursuit of land, wealth or power, has dominated the world for all but the last few centuries; and has started to reappear in the form of simulations and games. However, a lot of these simulations focus on the battle from an omniscient perspective or a heroic character with unrealistic abilities. The role of an average, singular soldier is often overlooked, instead focusing on the role of a regiment, a division of the army, normally 100-300 men.

**Background:**

Several online websites were used to find out information about medieval warfare:

[1] medievalwarfare.info hosts vast information about the technology, tactics and culture of medieval fighting. [2] The English Heritage website holds a lot of information about the history of fighting and the physical remains of battles.

The class of troops can be classified into quite robust categories, such as infantry, cavalry and ranged, which can then be specialised further to be more efficient at specific roles.

* Infantry: Infantry are soldiers fighting on foot, normally armed with swords, spears, axes. They made up the bulk of the army. Nobles, men paid by the king to govern, maintain and tax his land, were responsible for recruiting training and maintaining a sizeable force to fight wars or put down rebellions. The nobles were therefore responsible for the quality of the training and equipment of their men, the quality of armour, and weapons and training
* Missile infantry: The missile infantry had weapons that could be used from afar to attack lines of enemy infantry and were known to be deadly to those riding horses. Some ranged weapons took years to learn how to use, the English longbow took several years just to build the strength to fire it effectively. They would normally stand behind the main infantry line and fire into groups of enemy soldiers. Their focus on missile weapons means that they are very vulnerable to Calvary charges
* Cavalry: The cavalry are soldiers fighting on horses and normally consisted of the wealthier nobility, who had more expensive armour, weaponry and rode horses into battle. They were hence faster and better equipped than most of the men on foot. The cavalry could be split into two categories, light and heavy cavalry. Light cavalry was cheaper to maintain, and favoured missile weapons, that could be fired from a distance. Heavy cavalry’s role was to fight up-close, and so were more heavily armour, but much more costly.

Since cavalry consisted of richer men, it could factor in that they would be physically stronger, being able to afford their own training, were most likely trained from a young age and able to afford more food for better nutrient.

[3]

The main tactics used for a medieval battle was for the infantry and ranged to engage each other and the cavalry to engage each other separately. Once a break in the infantry was created, the cavalry would charge in to take advantage and force other breaks in the line. Once a line was broken it was much easier to kill as horses were not easily persuaded to charge a mass of pointy spears and swords. As a matter of fact, more men were killed in a hasty retreat than the actual battle.

**Aims and objectives:**

* To create a model of a battle, with different soldiers being represented by different shapes and different sides by different colours. The model should include:
  + Each side should attack the other until their moral runs out.
  + Men should stay in their units until they run (then its every man for themselves)
  + Infantry should inflict damage from a short distance
  + Ranged should release projectiles that inflict damage from a further distance

(friendly fire could be a significant factor)

* + Cavalry should be fast and attack each other until some of the infantry break
  + Once all the men from one side are ‘dead’ or had fled far enough away the battle ends
* Investigate witch men survive more often than others. Where were they positioned? what were their actions?
* Find the probabilities of surviving in different classes
* Find the optimum strategy for surviving a medieval battle.

**Methodology:**

I will be using java and processing to simultaneously stretch my programming skills and focus on a more object orientated approach. I will gather my results into a table and will then be using R for probabilities and numerical methods, as I am confident using it from my previous EMC.

My project will involve the following series of steps:

**1 Beginnings of a model:**

Using processing, I will use different shapes and colours to represent different sides and solider types. Each team will have a list of all alive members and their positions. Each soldier will iterate over each enemy’s team’s members and will move towards the closest member. Once in a certain radius the, the 2 members will deal damage to each other’s health. Once one of their health’s reaches 0, it will be removed from the battle and the left-over soldier will reiterate.

**2 Collecting data:**

Once all of one team health is below 0, information about the setup, surviving numbers, starting positions, their individual attributes and any bias created by random number generation, will be stored and transferred into a spread sheet. Using R, the data will be manipulated to see if any patterns emerge.

**3 Pre engagement setups:**

Medieval battles, consisted of more than a handful of soldiers

Before engaging with the enemy, the soldiers will be assigned to groups or divisions. They will march in preset columns and rows. The solders will then approach the nearest regiment of enemies and once close enough, attack and deal damage.

**4 Human-like behaviour:**

After a certain number have died within a regiment, the regiment will lose the will to fight and flee the field. Whilst fleeing, each man will run in the opposite direction of any enemies and will be deemed to have escaped after they have gotten a certain distance away from an enemy. It was the job of the cavalry to attack fleeing infantry. This means the cavalry will have to look for regiments that are fleeing and chase.

**5 Data collection:**

Once a battle is deemed over, information about both the living and dead will be collected and stored. Data from multiple varied battles should be collected to make sure the experiment is repeatable. It is likely that different scenarios will produce different results, so the setup and tactics used should be stored and looked at as well. The data we get from battles will then be used to see if there are any particular places or people who survive the battle more than others, and which tactics seemed to work better than others

**6 Improvement:**

Once a couple scenarios have been studied, the model itself will be updated or changed to try to more accurately simulate real world fighting. This may include more varied weapons, terrain as an obstacle or as an advantage and more accurate combat.

**References:**

[1] medievalwarfare.info

<http://www.medievalwarfare.info>

[2] English heritage:

https://www.english-heritage.org.uk/learn/story-of-england/medieval/war/

[3] explanation of a typical battle

typical battle http://www.medievalwarfare.info/#pitched