Introduction: Hi everyone, I'm Tugcem. Today i'll talk about my thesis topic. Currently i am working on multi-objective path planning in virtual environments with Faruk Polat.

Outline: Before beginning, i'd like to introduce the outline of presentation. First of all, i will give the motivation and the definition of the thesis that why we are getting deal with this problem. Then, I will give some related studies about this area. After, I will get into dynamics of the topic and elaborate the problem. I will consider about the boundaries and concepts of thesis. Then, I'll give what we have done so far, in which phase we are, and further to-do list.

The Basic Concepts: First of all, I want to give the basic concepts we are dealing with on this study. The path planning is basically a process that an agent or an intelligent structure finds a way out from initial location to a target one. We can diverse path planning into two main categories. The first one is offline planning, which is not bounded by a time period. The planning process is executed and the optimal paths are generated on offline time. After one or more optimal paths are found, the path is used to reach to the target. This method could be used on static environments. However, if we want to have a more realistic solution, we must consider real-time dynamics. The online path planning provides this constraint that the planned path changes on runtime according to evironment dynamics.

The other concept we are thinking over on this study is multi-objectivity. Single-objectivity oriented path planning considers only one constraint that could be the shortest or the easiest path. But this concept is again could not provide a realistic modeling of real-life problems. Actually, almost all of the real world problems contains more than one constraint. Thus, we consider more than one constraints while finding a path. The comparison between two solituons can be done via domination of these solutions to each other. The formulisation of this domination is another issue. Some constraints could conflict, so we need to think about all of them at the same time.

The third concept is thinking about a target which moves intelligently or unintelligently. This brings the pursuit operation into domain. The agent should re-generate its path according to target's movements.

The Problem Definition: So far, we have seen the basic concepts of this study. The general problem can be simplified such that we must find valid paths through a moving target with several constraints in a dynamic environment. Of course, environmental properties and restrictions matter on finding the solution for this problem. When we try to organize all of these aspects in the same problem, it is inevitable to encounter with some issues like complexity of algorithm, consumed time to find the solution and the resources that consumed. Actually, time complexity could be the most significant issue among all of these problems (issues). Thus, we are trying to come up to a new algorithm that covers all of these aspects and considers the time manner at the same time. That

means our algorithm should run fast - according to existing solutions- **Note:** Should be extended.

Related Studies: So, lets look into some related work around this research area. Actually, we could seperate these studies into 3 main captions. The first one centers on multi-objectivity concept while finding optimal paths. The second one centers on pursuit and chasing a moving target. The third one simulates alternative scenarios and solutions around similar concepts.

–Deep into the semantics and details of related studies...

Aim of Thesis: If we turn back into our study, I'd like to give the details of this study.

First of all, i try to give the boundaries and tradeoffs of this thesis. We must come up with a Multi-objective real-time path planning algorithm...The multiobjectivity brings the domination concept, which is used to compare the solutions that which one is better.

-we must formulate the definitions and dynamics of the thesis.