Majority of the discussion was spent broadening the understanding of the approaches described in the paper. This aided further discussion that focused on generalizing the paper's perspective of uncertainty, so that it can be applied in a universal manner. Examples of the application of evolutionary optimization in uncertain environments were provided by the class to support the ideas of the discussion. The highlights of these generalizations can be found in the roadmap document.

An early discussion revealed that uncertainty's role in early evolutionary optimization was minimal, partially due to the small part it played in classical optimization. Nonetheless, uncertainty has seen an increased presence in current techniques and its involvement will grow rapidly as optimization methods become more complex. This became apparent when Haitham presented an application that managed uncertainty by approximating the fitness function using meta models. This initiated a discussion about the importance of problem decomposition using analysis (top down) and synthesis (bottom up) like approaches. Identifying characteristics to understand the influence of uncertainty is a non-trivial procedure, especially when the focus includes many disciplines. Furthermore, although meta models are abstractions themselves, they are needed to relate between qualitative fitnesses and actual fitnesses when they can not be used directly due to constraints. It was also stated that the term meta modeling was used in a different perspective in software engineering practices. Another research challenge can be abstracted from this occurrence. Researchers will need to process and communicate each discipline's orientation on the concepts of uncertainty. It will be critical to find common ground and incorporate ideas from multiple perspectives to ensure robust adaptive systems. For example, in evolutionary optimization, uncertainty can be a beneficial aspect, as it will push populations away from local optimums. While in other disciplines, reducing uncertainty as much as possible is most ideal.

Discussions shifted to addressing the application and verification of multi-objective evolutionary algorithms (MOEA) in practical systems. Practical real time systems are currently limited in how MOEA can be implemented to find solutions. MOEA often require substantial time to find optimal solutions and the execution time can vary. In soft real time systems this may not be an issue as things need to happen in an allowable amount of time. For example, there has been significant development in using evolutionary algorithms in active controllers, such as in a group of elevators and robots. However, it may be harder to implement when dealing with hard real time systems were execution must occur at rigid points in time. Consequently, MOEA can be used in a passive or supportive manner through the optimization of design or planning for adaptive systems. In evolutionary optimization there exists benchmarked test problems for analyzing the performance of MOEA. However, none of them check for robustness in the face of uncertainty. Further discussion revealed that creating benchmark test problems that incorporate uncertainty across problem domains will be a research challenge. Unfortunately, some types of uncertainty are hard to quantify, such as unknown customer preferences when dealing with trade off evaluations in MOEA. The discussion highlighted several large events, Olympics and the World Cup, where unaccounted political choices were chosen over optimal solutions.

Final discussions compared the difficulty of the different types of uncertainty proposed in the paper. The overall consensus was that approximating the fitness function and a dynamically changing environment were the most challenging. The reasoning was that in these two types the fitness function is constantly changing, making locating the optimal solution a difficult endeavor. Lastly, Haitham stated that he has provided a folder of additional papers that may be of interest.