**Project 1 – Quick Look Report**

**Name**: Ankur Roy Chowdhury

**UIN**: 927001907

1. L. Lin and M. A. Goodrich, "UAV intelligent path planning for Wilderness Search and Rescue," in *IEEE/RSJ International Conference on Intelligent Robots and Systems*, St. Louis, MO, 2009, pp. 709-714.
   1. **Category/Context:** Search algorithms, WiSAR, path planning, UAV
   2. **Correctness:** Algorithms implemented with ‘effective’ results, implemented on simulation models rather than on an actual UAV
   3. **Contributions:** UAV path planning algorithms based on Local Hill Climbing and Evolutionary Algorithms with novel techniques like *global warming effect* and *path crossover/mutation*
   4. **Clarity:** Yes
   5. **Expected value to the project:** Groundwork in terms of how a WiSAR scenario is aided by a UAV; paper may be bit old
2. L. Lin and M. A. Goodrich, "Hierarchical Heuristic Search Using a Gaussian Mixture Model for UAV Coverage Planning," in *IEEE Transactions on Cybernetics*, vol. 44, no. 12, pp. 2532-2544, Dec. 2014.
   1. **Category/Context:** Search algorithm, UAV
   2. **Correctness:** Algorithms implemented and compared against BA and LHC-GW-CONV algorithm
   3. **Contributions:** the introduction of Gaussian Mixture Models to compute the mode good ratio (MGR) heuristic, which can be used to prioritize search sub regions in a hierarchical planner; two new path-planning algorithms
   4. **Clarity:** Yes
   5. **Expected value to the project:** Builds on top of [1]; expected to give a more state-of-the-art approach to WiSAR using UAVs
3. M. T. Agcayazi, E. Cawi, A. Jurgenson, P. Ghassemi and G. Cook, "ResQuad: Toward a semi-autonomous wilderness search and rescue unmanned aerial system," in *International Conference on Unmanned Aircraft Systems (ICUAS)*, Arlington, VA, 2016, pp. 898-904.
   1. **Category/Context:** Path planning, anomaly detection, computer vision
   2. **Correctness:** Algorithms were implemented on a real drone accompanying video footage
   3. **Contributions:** Path planning algorithms are assessed and developed upon in conjunction to computer vision algorithms for real-time on-board anomaly detection
   4. **Clarity:** Yes
   5. **Expected value to the project:** Provides a good big-picture outlook on how a UAV augments search with anomaly detection
4. Basilico and F. Amigoni, " Exploration strategies based on multi-criteria decision making for search and rescue autonomous robots," in *AAMAS '11 The 10th International Conference on Autonomous Agents and Multiagent Systems*, 2011 vol. 1 pp. 99-106.
   1. **Category/Context:** Search algorithm, multi-robot system, SAR
   2. **Correctness:**  Algorithms implemented on real robot
   3. **Contributions:** Presented the application of the Multi Criteria Decision Making decision-theoretic approach to the definition of exploration strategies for search and rescue
   4. **Clarity:** Somewhat
   5. **Expected value to the project:** Gives a new approach towards calculating the path cost
5. M. Pelosi and M. S. Brown, "Improved search paths for camera-equipped UAVS in wilderness search and rescue," in *IEEE Symposium Series on Computational Intelligence (SSCI)*, Honolulu, HI, USA, 2017, pp. 1-8.
   1. **Category/Context:** Search Algorithm, UAV, camera-position heuristic
   2. **Correctness:** Algorithm not implemented, only described; however, backed by rigorous mathematical models
   3. **Contributions:** Devised WiSAR search using the A\* algorithm for route planning; for path cost UAV camera-position utility
   4. **Clarity:** Somewhat
   5. **Expected value to the project:** Gives a different perspective in terms of how a UAV search path can be optimized