

# Paper Four Summary

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## Reference

Vandecruys et al [1] listed below.

## Important Keywords

**Ant Colony Optimization (ACO)** A metaheuristic inspired by the ant behavior of determining shortest path by concentration of pheromone present on the path. Ants returning faster to the colony leave a greater concentration of pheromone by doubling over on their path which is used as an indicator of the shortest path for other ants. ACO's artificial ants iteratively and stochastically construct solutions and add pheromones to these solutions. The pheromone is defined as the number of ants recently choosing a solution. When a new artificial ant encounters a decision it is more likely to choose path with a greater concentration of pheromone. The concentration is adjusted based on the evaluation of the solution. An evaporation constant causes the pheromones to evaporate and lowers concentration for each path.

**Software mining** The use of data mining to support and improve the development of software. The paper found three areas of interest covered by recent papers on this field: Fault prediction, the use of change histories to detect incomplete changes, and effort prediction.

**COCOMO II** A well-known example of a structural model designed to optimize the allocation of resources for planning and developing software projects. The authors note that the constants in COCOMO II are determined from trial and error and the scaling factors and effort multipliers are discrete, limiting the feasibility and accuracy of the model.

## Feature Extraction

**Motivational statements** The motivation of this paper is to apply AntMiner+, a rule-based Ant Colony Optimization classification technique to public

repositories and assess it's prediction and inference capabilities against other previously successful classification techniques in the domain of software quality.

## Possible Improvements

## Connection to Other Papers

## References

- [1] Vandecruys, Olivier and Martens, David and Baesens, Bart and Mues, Christophe and De Backer, Manu and Haesen, Raf. Mining Software Repositories for Comprehensible Software Fault Prediction Models. *J. Syst. Softw.*, 81(5):823–839, May 2008.