Título: **An Empirical Study on Software Defect Prediction using Exception Handling Metrics**

Data: **30/10/2017** Horário: **09h** Local: **Bloco 942-A**

Resumo:

Context: Software defect prediction (SDP) remains an active research field in Software Engineering. In SDP, the general idea is to employ the history version information about software artifacts and bug tracking to build a prediction model and uses it to classify the current version modules between defect prone and not defect-prone. Such classification can be useful to support prioritization and resource allocation in software testing activities. However, to build successful prediction models, it is necessary to select a suitable set of software quality attributes (software metrics). Previous work have reported that (i) classes which uses exception handling are more defect-prone then others; and (ii) the exception handling code contributes to software complexity growth and is a source of new kind of bugs, named exception handling bugs. However, to the best of knowledge, no empirical study has been conducted to evaluate experimentally the performance of exception handling code attributes as software defect predictors across multiples different datasets. Objective: To gather empirical evidence about the performance of exception handling code attributes as defect predictors by performing multiple series of experiments. Method: We proposed a set of exception handling based metrics and analyzed the impact of such metrics in the software defect prediction task, formalized as a classification problem. Additionally, we identified the most relevant metrics using a feature selection algorithm. Results: Our experiments showed that exception handling metrics can improve the performance of SDP methods when combined with classical metrics. We also identified the most relevant exception handling aspects for SDP. Conclusion: On basis in our

results, we conclude that some aspects of exception handling code is indeed relevant for SDP purposes, such as (i) the coupling between a regular class and the distinct exception classes it raises; and (ii) the proportion of catch blocks lines of code in a class.

Banca:

- Prof. Dr. Lincoln Souza Rocha (MDCC/UFC - Orientador)
- Prof. Dr. João Paulo Pordeus Gomes (MDCC/UFC)
- Prof. Dr. João Bosco Ferreira Filho (MDCC/UFC)