Thesis Topics
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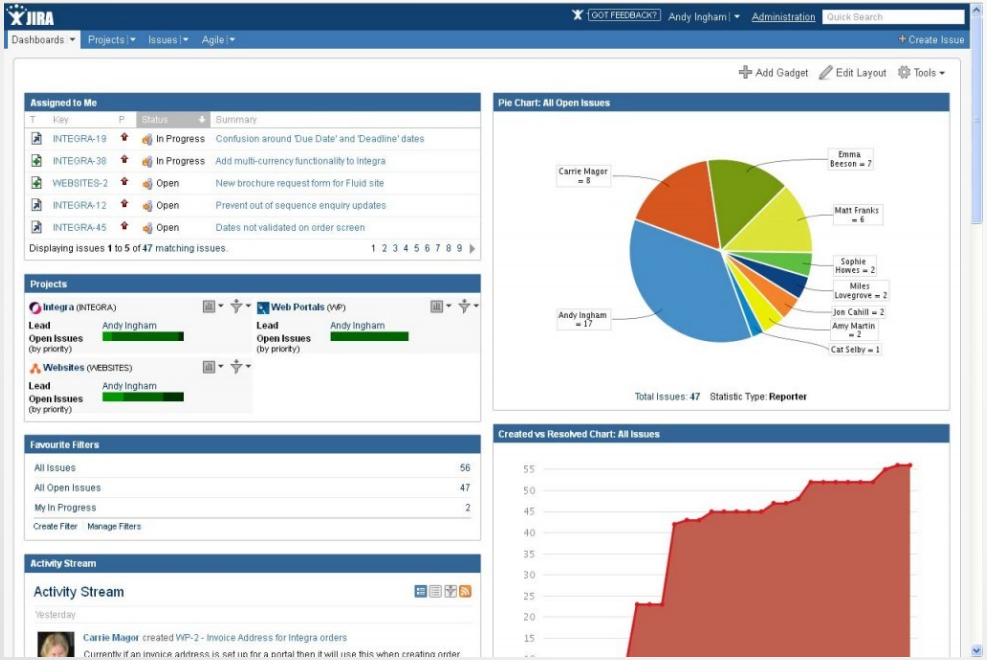
Computer-Aided Ticket Triage (1/2)

1

- **Ticket triaging** refers to the **assignment of tickets in issue trackers to the most appropriate developer(s) for their solution**.
- The current thesis will deal with the **design and implementation** a **software application** that would assist with a **triage** and **pre-analysis** of **newly raised tickets**.



Computer-Aided Ticket Triage (2/2)

1

- This thesis will be done in **collaboration with a company** - **data can be only accessed internally due to its sensitivity**. For this reason, the student will be requested to sign a **Non Disclosure Agreement (NDA)**.
- Learning data is available in the form of an **older SQL-based proprietary tracking system (MRTS)**, and **already existing tickets in JIRA**
- The input for the application would be a **newly raised ticket in Atlassian JIRA** and the the output **should be some, or all, of the following**:
  - a suggested **name of the assignee**, and/or a team;
  - a suggested **priority/importance** of the ticket;
  - a suggested **component**, and/or **section of source code**;
  - a list of **topically similar (older) tickets**;

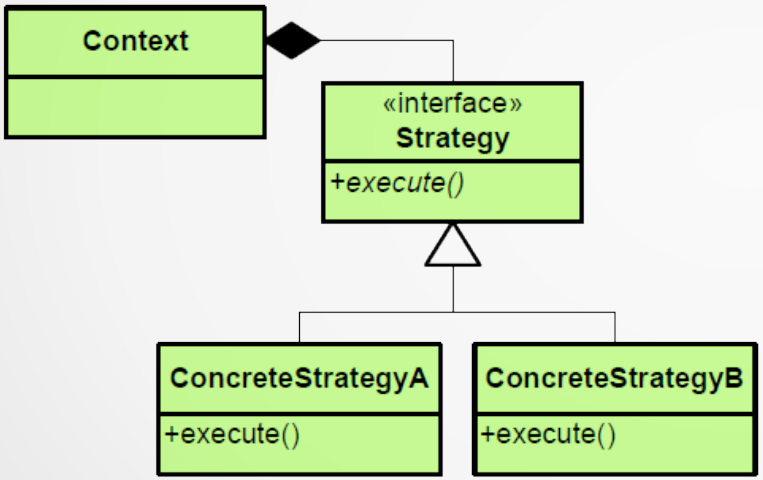
- **Skills requested**: *some development skills, interests for machine learning / text mining*

mlpy
machine learning py

Investigation of Design Patterns Grime in Software Development (1/3)

2

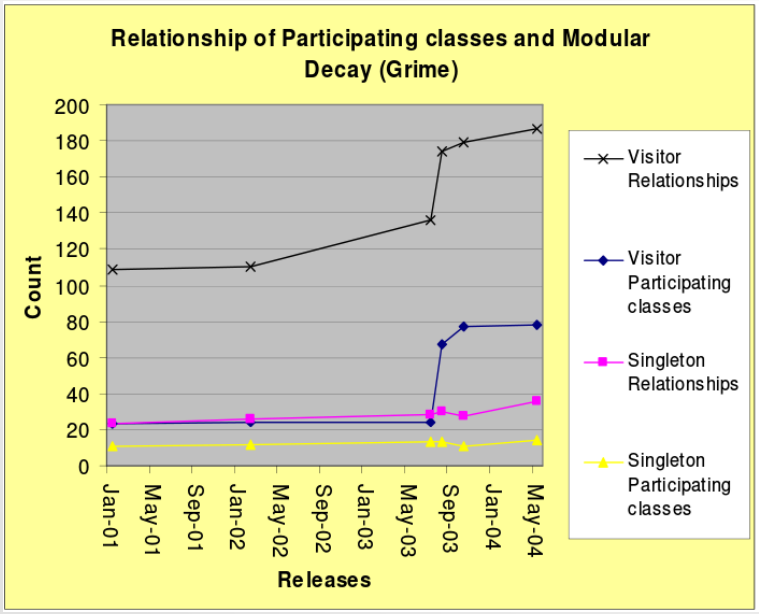
- Design Patterns are widely known to be **useful to better structure and design** software projects for **improved future maintenance**.



Investigation of Design Patterns Grime in Software Development (2/3)

2

- **Design patterns can decay** over time and **are subject to the so-called "grime" effect** → *accumulation of code not specific to the patterns that can also lead to the violation of the original goals for which the patterns were introduced*



Source: Izurieta, Clemente, and James M. Bieman. "Testing consequences of grime buildup in object oriented design patterns." Software Testing, Verification, and Validation, 2008 1st International Conference on. IEEE, 2008.

Investigation of Design Patterns Grime in Software Development (3/3)

2

- The current thesis is aimed at **understanding the "grime" and related phenomenon in literature**, the **practical part** will deal with an **empirical investigation of the presence and evolution of design patterns grime** in a set of software projects, understanding
- **different types of “grime”**
- **how frequent such occurrence** is
- **If there are some causes that are more frequent** (that is relation with other changes within systems during development)

Skills requested: development skills, interests in source code analysis

Applying Text Mining Classification for Software Requirements Prioritization (1/2)

3

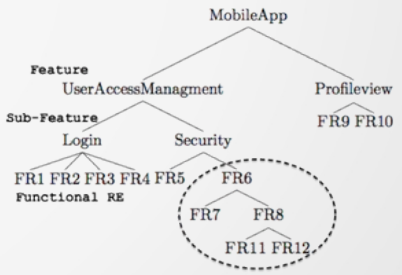
- **Requirements prioritization** is an important phase in the software engineering process that leads to the **decision about the most important requirements to be developed**

Applying Text Mining Classification for Software Requirements Prioritization (2/2)

3

- The current thesis will:
  - review the current state of the art in the **classification** and **prediction of priorities in requirements engineering**
  - evaluate **several techniques** (e.g. different classifiers like Multinomial Naive Bayes, Nearest Neighbour) for **machine learning reasoning** to recommend the **priority of requirements** to support **decision makers**

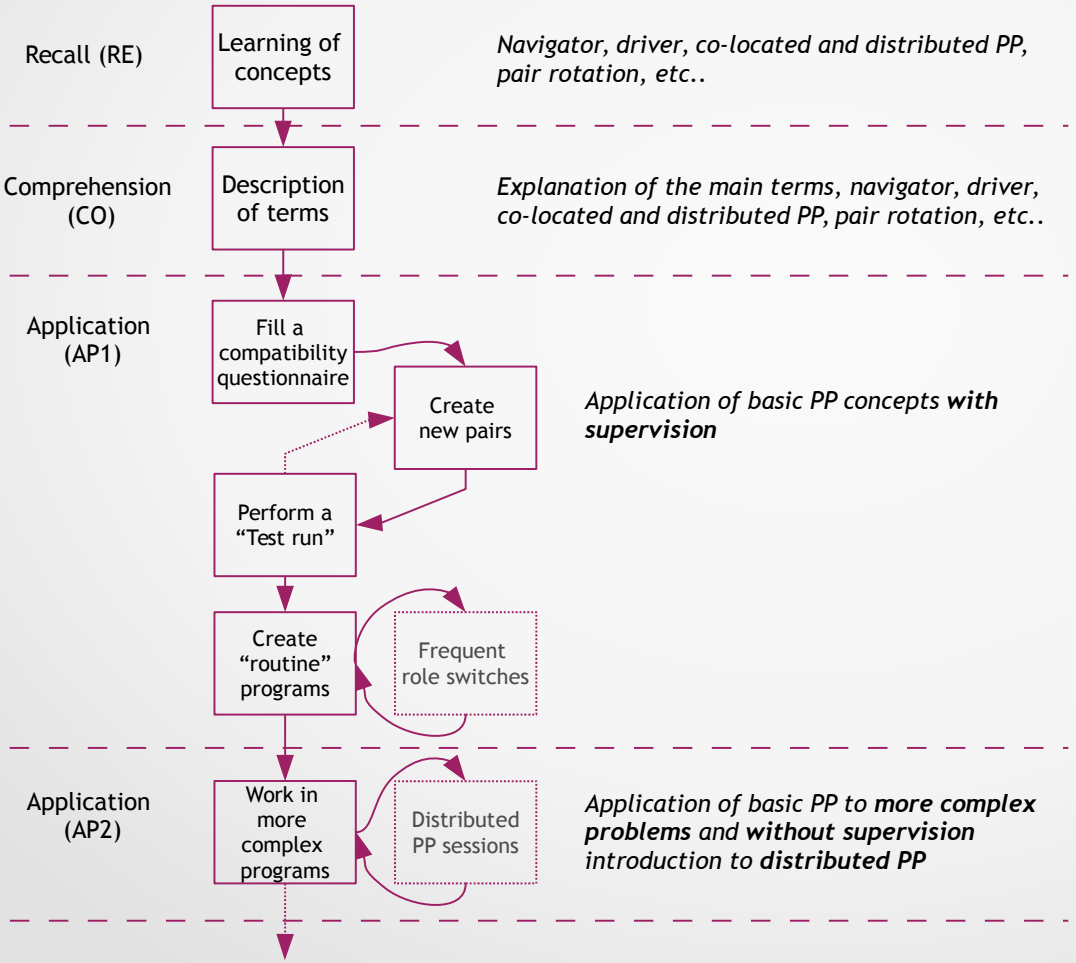
ID	Priority
ID	FRP4
Requirement	The system shall support user to login in the system.
Rationale	To access in the system, user required to login. Based on login authentication, system will support different functionality.
Title	Login
Dependencies	FRP1
Related	FRP5
Priority	High



Skills requested: interest in machine learning / text mining

A Controlled Experiment for Pair Programming Enhancement (1/2)

4



In a previous Master thesis *("Enhancing Learnability of Pair Programming Practice when introducing Novices")*, **a framework was created to improve the learnability of pair programming** by suggesting **several practices,** like **affinity scores** and **constant revisions** to better form pairs so that **novice developers** could improve their approach to pair programming.

A Controlled Experiment for Pair Programming Enhancement (2/2)

4

- The aim of the current thesis is to **revise the proposed framework** and **apply it** by means of a **controlled experiment** in order to understand:
  - the effects on students/developers and their feedback;
  - possible improvements to the framework;

  Tasks will be the **design**, **preparation**, **realization** and **evaluation** of a **controlled experiment** applied when **learning agile development practices**

$$R \quad \begin{array}{l} O_{3,1}\ O_{3,2} \quad O_{3,i} \quad O_{3,n} \\ \hline O_1 \quad X \quad O_2 \\ \\ O_1 \quad O_2 \\ \hline O_{3,1}\ O_{3,2} \quad O_{3,i} \quad O_{3,n} \end{array}$$

Skills requested: *interest in software development process and in doing empirical research, communication skills*

Additional Information

- If you need more information about one topic you can contact me at brossi@mail.muni.cz
- You can apply for enrollment in one topic through the IS

Bruno Rossi, PhD.

1. **A Controlled Experiment for Pair Programming Enhancement**

   Supervisor: Bruno Rossi, PhD., učo 232464

   Student (max. 1): *none yet*

   Pre-Requisites: NOW(SDIPR) *(taken from a list)*

   Display operations

2. **A Gamification Platform for Agile Development Practices** ***(not confirmed for defense)***

   Supervisor: Bruno Rossi, PhD., učo 232464

   Student (max. 1):
   1. Bc. Martin Češka, učo 430640, **FI** N-AP SSME [sem 3, year 2]

   Pre-Requisites: NOW(SDIPR) *(taken from a list)*

   Display operations

3. **Applying Text Mining Classification for Software Requirements Prioritization**

   Supervisor: Bruno Rossi, PhD., učo 232464

   Student (max. 1): *none yet*

   Pre-Requisites: NOW(SDIPR) *(taken from a list)*

   Display operations

4. **Computer-Aided Ticket Triage**

   Supervisor: Bruno Rossi, PhD., učo 232464

   Student (max. 1): *none yet*

   Pre-Requisites: NOW(SDIPR) *(taken from a list)*

   Display operations

5. **Developing a Media Marketplace Multi-Tenant Architecture with Windows Azure and ASP.Net** ***(not confirmed for defense)***

   Supervisor: Bruno Rossi, PhD., učo 232464