Composing Software Based on Detailed Specification in Natural Language

**Problem**
- Software development takes a lot of effort.
- EUSE approaches fail to create complex software and specific languages have to be used, which is highly limiting.

**Our approach**
- Compose software prototype by detailed specification.
- The detailed specification is a new use case body part in the form of a natural language.
- Based on the detailed specification existing software components are automatically configured and composed to the software prototype.
- The composition employs semantic lookup for recognizing and configuring components.
- Our approach is especially suitable for prototyping.
- In combination with UI generation tools seems particularly promising.

**Results**
- Participants: 15
- Use cases: 45
- Components: 90
- Identification of components (from 90): Recall 68.51%, Precision 90.17%
- Identification of methods (from 38): Recall 75.71%, Precision 75.71%
- Configuration of input arguments (from 37): Recall 73.15%, Precision 59.81%
- Composition of components (from 63): Recall 100.00%, Precision 100.00%

**Use case**
- **Name:** Contacting Customer Service
- **Actors:** Customer and staff
- **Short description:** The customer has a question for the staff
- **Main success scenario:**
  1. The customer requests to ask a question
  2. The system prompts for the email address and question
  3. The customer enters his email address, question, and sends request
  4. The system notifies the staff about the new question
  5. The staff answers the question
  6. The system sends the answer to the customer by email

**Source codes**

**Presented approach**

**External components**

**Name:** Email client
- **Description:** Send an email. Use SMTP to send email. Send group of emails.
- **Keywords:** email, smtp, mail, recipient, spam, attachment
- **Function:** Send simple email. Basic email communication. Notification by email.
- **Configuration file**

**Maven**

```xml
<dependency>
    <groupId>javax.mail</groupId>
    <artifactId>mail</artifactId>
    <version>1.4.7</version>
</dependency>
```

**Component details:** Email client. Email client that uses a local SMTP server. Code suitable for sending simple emails. All emails are sent from email address feo@eshop.com.

**Position:** Marker1

Author: Ing. Michal Kráľ
Supervisor: Ing. Michal Bystrický