# Composing Software Based on Detailed Specification in Natural Language

package application;

@FXML

@FXML

public class SampleController {

private Label IblQuestion;



## **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
- 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

#### 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%

private TextField txtFieldAnswer; @FXML private Button btnSend; @FXML Answer void answerQuestion() { //Marker1

Question









by email. Configuration file

Name: Email client

Description: Send email. Use SMTP

Function: Send simple email. Basic

email communication. Notification

to send email. Send group of

Keywords: email, smtp, mail,

recipient, spam, attachment











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 their email address and question
- 3. The customer enters his email address, question and sends request
- 4. The system notifies the staff about new question
- 5. The staff answers the question
- 6. The system sends the answer to the customer by email

Component details: Email client, Email client that uses a local SMTP server. Code suitable for sending simple emails. All emails send from email address foo@eshop.com.

Position: Marker1

#### Maven

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

Components identification

Components configuration

Components connection

Automated

Semantic similarity - WUP method

Semantic similarity - WUP method

Syntactic similarity - Levensthein distance alg.

Use case processing

package application; import com.automaticComposition.composedConfigurationFiles.\*: public class SampleController { @FXML private Label lblQuestion;

@FXML private TextField txtFieldAnswer: @FXML private Button btnSend: @FXML void answerQuestion() {

ComponentEmailClient.sendSimpleEmail("foo@eshop.com", "stu@gmail.com", "localhost", "Hello world", txtFieldAnswer.getText());

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