



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

PROJECT TENDER

PROJECT:
Biometric Access System (COSBAS)
CLIENT: Department of Computer Science

TEAM: <undecidables>

Elzahn Botha *13033922*
Jason Richard Evans *13032608*
Renette Ros *13007557*
Szymon Ziolkowski *12007367*
Tienie Pritchard *12056741*
Vivian Venter *13238435*

Department of Computer Science, University of Pretoria

Date: May 3, 2015

Contents

1	The Team	2
1.1	Elzahn Botha	2
1.1.1	Interests	2
1.1.2	Technical Skills	2
1.1.3	Past Experience	2
1.1.4	Non-Technical Strengths	2
1.1.5	Why I want to do this project	2
1.2	Jason Richard Evans	3
1.2.1	Interests	3
1.2.2	Technical Skills	3
1.2.3	Past Experience	3
1.2.4	Non-Technical Strengths	3
1.2.5	Why I want to do this project	3
1.3	Renette Ros	4
1.3.1	Interests	4
1.3.2	Technical Skills	4
1.3.3	Non-Technical Strengths	4
1.3.4	Why I want to do this project	4
1.4	Szymon Ziolkowski	5
1.4.1	Interests	5
1.4.2	Technical Skills	5
1.4.3	Past Experience	5
1.4.4	Non-Technical Strengths	5
1.4.5	Why I want to do this project	5
1.5	Vivian Laura-Lee Venter	6
1.5.1	Interests	6
1.5.2	Technical Skills	6
1.5.3	Non-Technical Strengths	6
1.5.4	Past Experience	7
1.5.5	Why I want to do this project	7
2	Project Execution	8
2.1	Development Methodology	8
2.2	Informing the Client	8
2.3	Initial Ideas on Solving Some Technical Challenges	8
2.4	Technologies We Aim To Use	8
2.5	What Will The Client Receive	9

1 The Team

1.1 Elzahn Botha



1.1.1 Interests

- Video Games
- Game development
- Programming
- Anime

1.1.2 Technical Skills

- I have already been exposed to Java and been working with it for about a year now

1.1.3 Past Experience

- I have experience in writing programs and systems in Java

1.1.4 Non-Technical Strengths

- Hard and dedicated worker
- Always ready to learn new technologies and languages
- Functions best under pressure

1.1.5 Why I want to do this project

This project seemed like it would be a rather interesting project to do as well as the fact that it would be great exposure to a whole new side of IT that I have not yet had the privilege of delving into. I believe that by doing this project I will get valuable exposure that can later help in other projects that I might attempt. This project also seems like it would be a good challenge since I am more comfortable with smaller projects and systems and by doing a larger project such as this it will help me broaden my range of capabilities. Lastly due to the size of the project and the strict time line the pressure will be greatly increased helping me to work at my best without losing interest with the project.

1.2 Jason Richard Evans



1.2.1 Interests

- Music Enthusiast
- Software development
- Adventure Sports

1.2.2 Technical Skills

- C++ and Java
- Web Development

1.2.3 Past Experience

Assignments and projects completed for University purposes. A lot of exposure with writing Java applications and servers.

1.2.4 Non-Technical Strengths

- Positive outlook on life
- Hard worker
- Good team worker
- An eager learner

1.2.5 Why I want to do this project

The field of computer security and the use of biometric systems is extremely interesting to me. I might not have the relevant experience but I know that my persistence and perfectionism will suffice in producing a well planned and valuable product. I am always open to new and exciting challenges and will enjoy this project as such. This project will also give me extremely valuable experience and help me grow as a programmer in software security.

1.3 Renette Ros



1.3.1 Interests

- Reading
- Playing Games
- Painting
- Puzzles and problem solving
- Programming
- New interesting technologies

1.3.2 Technical Skills

- Java
- C++
- Web Development
- HCI - User Experience and User interface design
- XML, XML Schemas and related technologies.
- Good at identifying possible problems and debugging code

1.3.3 Non-Technical Strengths

- Hard Worker
- I don't like to do things halfway
- I learn new technologies easily
- I'm very enthusiastic about things I'm interested in.

1.3.4 Why I want to do this project

I want to do this project because I am interested in biometrics and I believe this project has the potential to be very useful in many different settings. I enjoy challenges and I believe this project will help me gain valuable experience in both software engineering and working with multiple different technologies, libraries and APIs.

1.4 Szymon Ziolkowski



1.4.1 Interests

- Networks
- Security
- Computer hardware and electronics
- Paintball
- Video games

1.4.2 Technical Skills

- C# and Java
- Web development
- SQLite, MySQL and SQL Server

1.4.3 Past Experience

I have no past experience that might be relevant to the project.

1.4.4 Non-Technical Strengths

- Don't give up easily
- Helpful

1.4.5 Why I want to do this project

I want to do this project because it interests me greatly, it also poses many challenges and has a cool factor to it. I have little to no experience in most aspects of this project but this is also the reason why I want to do this project as it will allow me to gain experience and learn new things.

1.5 Vivian Laura-Lee Venter



1.5.1 Interests

- Computer Games
 - First Person Shooter
 - Sport/Soccer
 - Strategic
- Music And Movies
- Watching Sports Fanatic:
 - Rugby
 - Football
 - Cricket
 - Athletics
- Software Development/Programming
- Computer Hardware/Gaming System builds Fanatic

1.5.2 Technical Skills

- Java and JavaFX
- C++
- Client/Server Applications (Beginner)
- Web Development (Beginner)
- Design Patterns
- Program/System Tester and Debugging

1.5.3 Non-Technical Strengths

- Hard-Worker
- Compationate
- Competent in knowledgeable/experienced fields
- Good Listener
- Diligent
- Integrity

- Willing and keen Learner
- Dedicated to my studies and work
- Team Player
- Leader when I need to be

1.5.4 Past Experience

- I have written Java programs and small systems as assignments for my modules at the University of Pretoria
- I have written C++ programs and small systems as assignments for my modules at the University of Pretoria
- I have written several types of server programs (e.g HTTP) as assignments for my modules at the University of Pretoria

1.5.5 Why I want to do this project

This project is certainly something I have never done before. Being only a novice in Biometrics, I am extremely interested in the biometrics aspect of this project. I wanted to do a project where I could learn new, interesting and relevant things. Although this project will be a huge challenge I am willing to dedicate myself and work hard to succeed.

2 Project Execution

2.1 Development Methodology

Our team will be using the **agile software development methodology**. The agile manifesto states that we find value in the following four points:

- **Individuals and interactions** over processes and tools.
- **Working software** over comprehensive documentation.
- **Customer collaboration** over contract negotiation.
- **Responding to change** over following a plan.

Although we find value in the items on the right, we value the items on the left, emphasised in bold, even more.

In agile development, the testing phase, which is usually separate from development in other methodologies such as Waterfall, runs concurrently with development. This increases the *quality* of the product and means that at any point in the development phase there will be a *working model* available with new features and functionality being added only after they pass vigorous testing.

The agile methodology has a proven low project schedule risk and the ability to respond to change, from the client or development team, quickly.

2.2 Informing the Client

Our team will have an active, regularly updated, wiki on GitHub and we will also use the GitHub Issue Tracker with Milestones to inform the client on the status of the product, features integrated into the working model and any other information deemed important by the team. We will also ensure to attend an annual two-weekly meeting with the client to give feedback on the product as well as getting new suggestions from the client on possible changes and improvements.

2.3 Initial Ideas on Solving Some Technical Challenges

With this project we will be focusing on facial recognition as an authentication service, although we will be developing the product in a highly pluggable manner such that other features like fingerprint scanning will also be supported. The use of third-party APIs will be used for extracting valuable information from images to enable facial recognition.

Multiple quotes for hardware needed will be gathered, primarily from UP vendors, to get the most cost-effective and high quality hardware for the system. A proposed budget and cost of project will be given to the client for approval after all quotes have been scrutinised.

2.4 Technologies We Aim To Use

A Java-based server will be used in conjunction with the OpenCV library interface. This decision was made based on the availability of third-party APIs and the ability to attach security certificates. A highly responsive web-base client-side JavaScript application will also be used as it is

not OS dependent, looks and feels like an independent application and can work on both mobile and desktop environments. For calendar functionality mentioned in the functional requirements, we aim to use the Google Calendar API for a more mainstream and accessible system.

To capture images to process for authentication purposes, we aim to use a small lightweight camera that is linked to a Raspberry PI (or similar lightweight computer). This will simply capture the image and send the information to the server for facial recognition and authentication.

2.5 What Will The Client Receive

On completion of the development cycle the client will receive the following:

- The complete source code.
- The complete installation scripts.
- An in-depth user manual.
- An in-depth installation manual.
- A small working prototype system to showcase the system.
- All hardware purchased by the client for the system.