# COS 301 Project Proposal

COS Biometric Access System

version 1.0

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<tr>
<th>Client Name</th>
<th>Department of Computer Science</th>
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<tr>
<td>Contact Person</td>
<td>Prof AP Engelbrecht</td>
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<td>Contact Email</td>
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1 Project Name

This project will be referred to as the Computer Science Biometric Access System, COSBAS in short.

2 Vision and objectives

Access control is an important issue with reference to both security to staff and students and to our equipment and resources. However, an access system to an academic department with a continuous stream of visitors (students, staff from other departments, industry partners) should not be too restrictive to hinder easy access to staff members, more so with respect to visitors to the fifth floor. The current card system is not efficient.

This project will design and implement a new access and information system for the Computer Science department.

2.1 Vision

Our vision is to create a new access system that makes use on non-intrusive biometrics and mobile technology to obtain and to grant access to visitors. In addition, the system will also serve as an information portal on the availability of staff, schedules, and news.

2.2 Objectives

The objectives of COSBAS are as follows:

[a] To provide more secure access to both staff and visitors of the department.
[b] To provide information about the availability of staff members.
[c] To provide functionality to make electronic appointments either at the help desk, via a web-based application, or a mobile application.

3 Owner

The owner will be the Department of Computer Science, University of Pretoria. The contact person is Prof Andries Engelbrecht, head of the department, and he will be the contact person. Appointments to see him should be made via Mrs Angela Bekker (abekker@cs.up.ac.za), or alternatively, communication can be via email to engel@cs.up.ac.za.
4 Scope

The main functionality of COSBAS is that of secure access to the department, using non-intrusive biometrics and technology. Two categories of access will be defined, i.e. staff and visitors. Staff should be allowed to gain access through any of the class doors leading to the fourth and the fifth floors of the department. Biometrics such as finger printing, voice recognition, face recognition should be investigated and one or more of these implemented. Access to visitors can be based on two approaches: Ad hoc visitors are those who do not have an appointment and reports to the help desk. If the staff member is available, photo/fingerprint of visitor is taken and access is granted for a time period. Visitors with appointments can be send a barcode, QR code, data matrix, aztec code, etc, and this barcode can then be scanned by the entrance doors to gain access for the allowed time period.

Record should be kept of whether someone who has entered, also left. In addition a log should be kept of the times of entry and exit.

COSBAS should provide information about the availability of staff members. This can be done via a mobile application or web-based application through which a staff member can indicate on a calendar that he/she is available. Alternatively, a link between electronic calendars such as google calendar can be created to see when staff is available. This functionality can also be used by a visitor to book an appointment with a staff member using the mobile or web-based application. The appointment booking facility should allow future bookings and also booking cancellations from both staff member and student.

Lastly, lecture time tables, lecture venues, test dates, news items, FAQ, or any other information can be provided by COSBAS via an LCD screen in the reception office or via mobile application.

5 Architectural requirements

5.1 Functionalities

COSBAS will contain the following key features.

5.1.1 Staff Access

Staff access will be via one or more biometric evaluation. Options to be investigated include fingerprint recognition, voice recognition, or face recognition.

5.1.2 Visitor Access

Visitor access will be via one of two approaches, either biometric (finger print or face recognition) or via some code. Visitors to be allowed access for a limited time period.
5.1.3 Appointment Booking System

Visitors should be able to make bookings to see staff. Bookings can be web-based or via mobile application. If such a booking is made, the code should be generated and send to the visitor, who will then use this code to gain access to the department. It should be possible to also scan or query a booking.

In order for visitors to be able to make a booking, staff will indicate availability via a web-based or mobile application, or this information will be extracted from electronic diaries.

5.1.4 Information Portal

An easy-to-use approach should be developed to post information to the information portal. There should also be a corresponding mobile application to view such information.

5.1.5 Reporting

A reporting functionality should be provided, where admin users can query if and when a certain person gained access and when left. Additionally for the head of the department a reporting tool should be created to indicate when staff entered or left. Additional information such as visitors not honoring appointments or staff not honoring appointments can also be provided.

5.2 Quality Requirements

COSBAS should be reliable. We do not want to give access to someone who should not have access, and we do not want to be locked in or locked out.

Information about staff and visitors should be secure. It should not be possible for any third party to gain access to biometric information.

The system should be generic and scalable. It should be possible to plug in new biometric technology or replace existing ones.

5.3 Integration and Access Requirements

The system will potentially have to be integrated with electronic calendars and/or the Computer Science portals. Also, integration with the postgraduate management system’s meeting control center should be investigated.

Interaction with the system will be via mobile and/or web-based applications and also via biometrics.
5.4 Technology Preferences

There are no preferences and the team should identify the most appropriate frameworks, programming languages, platforms, etc.

6 Skills Requirements

Instead of listing skills, we list below the Computer Science subject areas that will be very important for this project:

- Very good programming skills
- Mobile computing, netcentric computing
- Image analysis and recognition
- Information security

In addition, the team needs to show innovative skills and research skills.

7 Project Deliverables

The following deliverables:

- all of the source code;
- all of the documents, most importantly a user’s manual, installation manual;
- all of the installation scripts;
- a working prototype system.

The objective of this project is to, in the end produce a product that can be installed and used.

8 Intellectual Ownership

The IP will belong to the University of Pretoria.

9 Client Commitments

This project will require a number of hardware components. Funding to purchase these components will be made available provided that intensive research into the applicability and costs (both upfront and maintenance) have been done,
that all options have been investigated and that a budget be proposed as a re-
sult of obtaining a number of quotes from different vendors. Note that vendors
have to be UP suppliers where possible.

Two-weekly meetings will be scheduled with the team, and it will be required
that all members of the team attend these meetings.