

Project 1) Emily Dotson of E-Studio

eStudio Appointment Scheduling Project

We are a writing, oral communication and digital media studio. We assist students in the College of Engineering by providing trained tutors and equipment to assist with communication projects. We need a scheduling and reporting program to manage our studio and assist our clients. See a video about us at <http://www.youtube.com/watch?v=kaYo6rNpE9c&feature=plcp>

Arts and Science IT built a software program for us when we were the Writing Center in 1995. It worked great for the first few years. It cost us @20K. Unfortunately, the programmers who built it left UK for other jobs. The new programmers attempted to make corrections as things started to get quirky. We were in weekly meetings after the year 2000 when our software decided it was 1900 and it refused to allow us to set a new Spring schedule. Finally, after working months, they told us that the programming code was unreadable. They explained that there were almost no comments describing the code, it was bizarrely formatted, and there was no consistency in terminology so it was impossible to understand even by the new team of super smart programmers. This meant 20K down the tubes because of bad coding! We want this new program you provide us coded with so many comments it looks like a love letter. This has to be understandable and repairable by others beyond you. For the past year we have used bookeo (<http://www.bookeo.com/>) and hate it. It does not report on “customer” data so we have to do that manually and does not allow for group appointments. We just don’t have the budget for another big software purchase and since we are student centered we would love it if this program was built by our own students. Fame and gratitude await you at the estudio!

We want an easy to install self-contained and very stable software application that allows students to make online appointments for our services and tutors, and allows us to log activity and record appointments and also produce reports based on studio activity. It should be a rock-solid database, an easy to use web interface, and a powerful web-server process all in one easy to maintain application.

We want to know the following about our clients: major, year, reason for visit and course number if applicable, and service requested. We want to know the following about our consultants: # of appointments, time tutoring per schedule, # of client cancellations or missed appointments, and number of schedule changes. We also want to know what equipment and services are being requested and in what numbers by major and year. We would also like to see when we are most often booked and when we are slowest and if there are any patterns to student usage by hour, day or month. We want all these reports to be accessible daily, monthly, and by semester or year. It needs to be a multi-file relational database that can execute complex queries quickly and store billions of records.

On the client end, it should allow multiple users access simultaneously and restrict access to data. It should collect demographic data for reports before allowing an appointment. Students should be able to schedule up to a month in advance with a limit of no more than three booked appointments in one month. Students should be restricted to no more than one appointment per day. Students should be able to choose appointments by date, time and consultant. Automated appointment reminders should be sent two days in advance and a survey should be sent one day after. The software itself should be cross platform, able to be installed on any Windows OS as well as any Mac OS platform. Users should be able to access and work with the system from any web browser in any operating system. In our fantasy's, we would like to be able to use student ids and a barcode scanners or magnetic strip card readers to log students in and out of visits, but this is not a priority.

It should be able to be accessed administratively by more than one user at a time however it should indicate to all logged on every current administrative user. It should be administratively searchable by student name or email as well as by date. We should be able to record no shows and cancellations and log in clients quickly manually or ideally with a bar code reader. This should be able to manage schedules for up to fifty consultants and be able to be blocked out for holidays and meetings. It should record activity for consultants and clients as well as equipment. We should also be able to set and change schedules easily and make and change appointments by time, date or consultant at any time. Most importantly, we should have an administrative override for walk in appointments. We would also like to have an automatic email built in to remind students about upcoming workshops, appointments, or a resource that they checked out and did not return.

Project 2) Family networking/video sharing – Mark Magnotta, Robert Ford, Paul Myers, Anthony Riccitelli (Robert is UK CS alum)

Students will develop an alpha version of a family networking and video sharing site.

For the purposes of this project, the site must support:

1. adding family members
2. modifying family member data
3. establish relationships between family members
4. uploading videos to a family member's profile through a web interface

Though not required, you may also attempt the following:

1. establish familial relation graphing functionality
2. establish functionality to join multiple family trees (ex. your family tree with a spouse's family tree)
3. mobile video upload (Android, WP7, iOS)

The particulars of the implementation are largely up to the students. However, it must:

1. hold to separation of business logic and interface (ex. MVVM model)
2. not use proprietary/closed source interactivity frameworks (ex. Flash, Silverlight, etc). Note: HTML5 and MIT\GPL\BSD licensed libraries are fine."

Project 3) Keeneland SmartPhone App - David Pienkowski, Department of Biomedical Engineering

I have a proposed “win-win” project that will benefit the student, Computer Science, and UK Children’s Hospital simultaneously.

The project involves developing a smart phone app that maps the grounds of the 2014 Keeneland Concours d’Elegance and provides visitors with the ability to know the full extent of the show and where items of interest are located.

The Keeneland Concours d’Elegance is one of the nation’s major classic car shows. It includes more than 500 “show” vehicles and 20,000 spectators. All proceeds from this show are donated to the KY Children’s Hospital here at UK. This all-day event will be held on Saturday 19 July 2014.

The event encompasses more than 80 acres of exhibit space on the Keeneland property (next to the racetrack). An event of this size frequently has participants asking “...where may I find _____”?

The ideal solution to this problem would be a smart phone app that shows a map of the entire event, including food vendors, lost and found, information, raffle, specific car categories, first aid station, rest rooms, etc. Ideally, a user “location” triangle would orient the smart phone user to their specific spot on the Keeneland grounds map. Enlargements of specific areas would also enable participants to find particular show categories, food types, and perhaps even specific cars.

The student would have the opportunity to work with the Concours organizers, discern particular needs and adapt the app (pardon the pun) to these needs, as well as participate in the “marketing” of this app to potential users via the Keeneland Concours website and “on site” implementation.

Advertisement of this app on the web will promote attendance, ticket sales, and revenues for the UK Children’s Hospital, as well as give the student exposure to “working with customers”, app development, and interactions with a wide variety of people who do not usually interact with such students, but who could open doors that this student never knew existed. The management of Keeneland is integrally involved with the Concours d’Elegance and it would not surprise me if they liked what they saw in this app and asked for other apps to be developed for their events. This could lead to exciting consulting opportunities for students and the CS Department.

Project 4) – Medication SmartPhone App - Samantha Wang, UK College of Pharmacy APhA-ASP Operation Self Care (Non-profit)

The mission of Operation Self-Care is to educate the community on OTC medications and teach patients what they can do to optimize their treatment from healthcare providers. Many patients are on multiple medications from multiple healthcare providers, and most patients do not know what medications they are on, or what they are for. This creates a significant barrier to treatment that can lead to costly inefficient treatments and harmful adverse drug reactions. Operation Self-Care wants to make a smartphone app in which patients can input and update their medications, regimens, prescribers, and photos of prescriptions. This app will also provide a library of cheat sheets for major drug-drug and drug-food interactions. There will be an Ask a Pharmacist tab, which will locate the nearest pharmacies and their contacts. Ideally, this app will also be able to identify the purpose of each drug (anti-hypertensive, anti-diabetic) upon entry.

Project 5) - Unity Game, Awesome Inc., contact there is Nick Such

Use the [Unity development framework](#) to create a game that can be deployed to a variety of platforms, including the [Ouya console](#) or the [Lexitron arcade machine](#). Team members will work with John Meister of local game development studio [Super Soul](#) and receive some training on necessary development tools.

Requires: Unity and C#/Javascript

Mentors: [Patrick Kelly](#) & [John Meister](#)

Project 6) – Android App, Awesome Inc., contact there is Nick Such

Work with local Android developer to build your own mobile app. Design a product that works on a variety of handheld devices and has market potential. Team is open to choose their own content, ranging from games to productivity tools to media applications.

Requires: Java/Android, web services

Mentor: [Chris Allen](#)

Project 7) – OptionApps Dashboard Chris Moore, Fishback Management & Research, Inc.

Where we are

OptionApps is an HTML5 application that analyzes options. The program runs in all browsers. There are also native app versions of OptionApps: iOS, Android and Kindle HD.

OptionApps utilizes a database comprising about 58 BILLION datapoints. In addition to the main database, OptionApps provides a handful of charts that are produced from data taken from the web and entered into spreadsheets. These spreadsheets create charts that are pushed to OptionApps users.

Project Description

For this particular project, the goal is to develop an automated way to create visualizations of that information in a “dashboard” format.

You will create a server-side, web-based program that gathers the data from our database and other sources, organize it, measure it, and display the results in gauges and charts. The graphics library we use is Highcharts. [Other graphics libraries may be considered if your team chooses.]

Your team will be using the latest technology available: HTML5/Javascript.

The database is MySQL (5.1)

Project 8) – Lexmark Multifunction Peripheral App Development, Shaun Love, Lexmark

Lexmark MultiFunction Peripherals (MFP) provide users with the expected functions of printing, scanning, copying and faxing. In additions, these MFPs have an embedded Java Virtual Machine (JVM) that allows users to download and execute applications that extend the MFP’s capabilities far beyond the basic functions. Lexmark provides a Software Development Kit (SDK) that gives application developers access to virtually all of the MFP capabilities. This includes network and internet, USB, touch screen, buttons, RAM, flash storage as well as pre-existing workflows such as scan and email.

In this project, students will be provided with the SDK and will develop and run one or more applications for Lexmark MFPs. Application suggestions will be provided but students may choose a topic on their own. Also, the scope of an application will determine if developing the one is adequate or if there should be more than one.

The following are some examples of applications developed in the past.

Testing and grading application. A teacher uses this app to create customized bubble answer sheets to administer a test. Each answer sheet contains the student's name and a machine readable bar code. To grade the test, an answer key is placed on top of the stack of answer sheets and scanned in. Optical Mark Recognition (OMR) identifies the student's answers and bar code recognition software identifies the student. The grades are entered into a database and a summary report of overall class performance is printed. A commercial, server based version of this app is currently in use by the New York City Department of Education, the largest in the country.

Email Phrasebook application. When scanning a document to send as an email attachment, it is often desirable to include explanatory information in the body of the email. This application provides the user with a database of commonly used phrases that can be selected for inclusion in the subject line or message body. The database also includes foreign language translations of the phrases so that email sent internationally can contain the phrases in the recipient's native language. Additionally, the user prompts can be images of text that were generated on a workstation in a language other than English. This allows the application to be used by non English speaking users throughout the world.

Color correction for color vision deficiency: Approximately 8% of the population has some level of Color Vision Deficiency (CVD). Commonly called color blindness, CVD makes some colors hard to discriminate even though they are obviously different to individuals with normal color vision. This can cause great confusion in reading documents where information is color coded such as in pie charts. In this app, a document such as a pie chart is scanned and a search is made for pairs of color regions that could be confused by those with CVD. One of those colors is changed to make them discriminable and the document is printed. Care must be taken to ensure that the change does not create a different confusing pair and also that it is small enough to preserve the intended experience for viewers with normal vision.

Concierge application. Upscale hotels provide their guests with the services of a Concierge. This is a person who can make recommendations about local restaurants, provide directions to local attractions, theater times, guided tour suggestions and many other guest services. Budget conscious hotels can provide many of these same services by having a Lexmark MFP in the lobby running a Concierge app. The app prompts the user for the type of service they need. This can include restaurant choices, walking tour maps, weather reports and a great many other services where the information and transactions are available over the internet. The app obtains the needed information, conducts the transaction if there is one, and prints the result.

Because the SDK is Lexmark confidential, students must agree not to make any unnecessary disclosure as to its contents.

Project 9) - Painting image area selection, Shaun Love, Lexmark

When working with original text documents, sections of text can be selected by moving a cursor over the desired section of text. This area of text is highlighted and the user can perform various operations on it such as cut. With mobile devices there is an increasing tendency to capture images of printed documents so as to have an electronic document rather than a hard copy. This electronic document is fundamentally different than an original text document because it is purely image and has no text information. In a text document it is known that there are characters at specific locations so a cursor moving over those location can select those characters. In a scanned image of a text document there is no knowledge of character locations to enable cursor selection. To obtain such information, OCR may be performed but this is an expensive operation. An alternative is to use the cursor to encircle a region of interest (roi). The area encircled or the circle itself may be highlighted and an operation such as crop applied to the area. Accurately drawing the circle around the region of interest may be difficult to do and give poor results when an operation is applied. In addition, circling the roi does not correspond to the familiar method of selection in an original text document. The goal of this project is to create a method for accurately selecting text in an image of a document that corresponds to a familiar method used in text documents.

In the traditional method of selecting a region of interest in an image, the image content is not considered. To accomplish the above goals the current project uses a content based method of selecting the region of interest. The content is typically text characters that are connected components. These characters are closely adjacent to others to form words, sentences and paragraphs. An ocr operation starts by attempting to identify connected components representing characters however, it then does a correlation to identify what the characters are. It follows this with dictionary searches and other expensive operations to reconstruct the original text. For selecting a region of interest, this additional processing is unnecessary and is a significant burden. In the present project, the cursor is used to identify a location within a region. The extent of the region of interest can then be determined by content based selection with familiar or intuitive cursor movements.

In one mode of operation, clicking the cursor anywhere within a paragraph of text results in that paragraph being selected. This is done by finding a connected component near the cursor location. This comprises the original ROI. Other connected components adjacent to the roi are added to the roi if the distance between them is less than a threshold. In this way touching a single character can form an roi that contains the adjacent characters in a single word. By varying the threshold it would be possible to select all the characters on a line of text. By having separate horizontal and vertical thresholds it is possible to control the selection of multiple lines of text. If the line spacing between paragraphs is greater than that within paragraphs, a paragraph is easily selected. If line spacing is uniform, the last line of a paragraph may be identified by such clues as lack of right justification of the current line being added to the roi.

In another mode of operation, the user touches the top line of a desired section of text and moves the cursor downward to the bottom line. Using connected components and a horizontal threshold to determine width of the roi as above, the selected area extends vertically from the original cursor position to the final. The first line of a roi may not be left justified due to the line containing the final words of the previous sentence. It is possible to begin the first line of the roi and not allow it to expand left until it has expanded down. The last line of the roi may not be right justified and there is the beginning of an undesired new sentence. In this case the final line of the roi can exclude the undesired area if, when the vertical limit is reached, expansion of the roi is from left to right and horizontal expansion stops when the cursor horizontal position is reached.

In another mode of operation, the act of roi selection is combined with the specification of an action to

perform on the selected area. For example, selecting an roi with a downward cursor motion could indicate an operation such as crop. Selecting an roi with an upward cursor motion could indicate a different operation such as erase. If the results of the roi selection with automatic operation execution gives undesired results, the image can be restored by an undo operation.

Project 10) - SmartCat App_NickCronin – UK alum

<https://docs.google.com/document/d/1SZs0DS2L1MTuBIFDPZh1CaL2ekCSf2cKp9ERICHkt2E/edit?usp=sharing>

This is a link to the document. If it does not work I have copied the text here:

SmartCat App
Nick Cronin - Team SmartCat

Seeking a team of motivated individuals who wish to leave a lasting impact on the Big Blue Nation.

I am part of a multidisciplinary team of recent graduates. In the spring semester we were tasked with finding ways to improve campus amenities. Through our research, we realized that the university has strong amenities compared to institutions of similar size and type. What we lack however, is a uniform way of connecting and accessing these valuable resources.

Our solution is the SmartCat App, an intuitive app that is for the students and by the students. We envision an application that allows students to fully utilize the facilities, services and technology. For students SmartCat can be an achievement based rewards system, an alternate student ID, and an invaluable guide to student life. For the University SmartCat can show how much each facility is used, provide continuous student feedback, and account for students on campus during emergencies.

Although our Microsoft Paint concept pictures helped to convey our ideas, we are at the point where we need your help developing the functioning prototype. Come join team SmartCat!