

COSC345 Project Experience Report

AutoCull (Group 11)

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Abstract—This document is intended to detail the experience of Group 11 throughout the development of AutoCull for COSC345. Included is a reflective assessment of the project management, design, implementation and testing processes. Lessons learned and recommendations for future iterations of the project are also discussed. Along with personal contributions to the project as a whole.

Index Terms—TODO: keywords

I. COSC345 INTRODUCTION

COSC345 is a 300-level software engineering course offered at the University of Otago. The course aims to provide students with practical experience in the field of software engineering and delivery, and is designed as a capstone course for both computer science and software engineering students.

This allows for the application of theoretical knowledge gained in previous papers, as well as the development of soft skills such as teamwork, communication and project management. The application of good software engineering practices is also a key learning outcome of the course, with students gaining a better understanding of why these practices are important in a real-world setting.

The course is structured around a single project completed in groups of 4–6 students over the course of a semester. The project is largely self-directed, with groups expected to attend a weekly mentoring session with a course mentor; meeting times outside of this are to be organised by the group themselves.

A. Project Overview

Professional digital photography is data intensive. A single photoshoot can quickly amount to hundreds or even thousands of digital images, many of which are similar or near-duplicates. Manually culling these near-identical images can be time-consuming and tedious but is a critical stage in the post-processing workflow of editing and delivery.

AutoCull is a desktop application which makes use of ML/AI algorithms to assist a photographer in culling large quantities of photos. In addition to culling, the application provides feedback to the photographer on the objective quality of their photos, providing a quick and easy way to identify their strong and weak images. This feedback can help photographers

improve their skills over time, as well as providing a second opinion on the quality of their work.

Whilst the digital media market is already saturated with post-processing applications, there are comparatively few applications with such a strong focus on the culling process itself. AutoCull aims to fill this gap in the market, providing a tool which can significantly reduce the time a photographer spends on post-processing, and providing the feedback they may not otherwise receive. Subsequently, this allows photographers to spend more time doing what they love – taking (and editing) photos.

B. Objectives and Features

The objectives and features of AutoCull include:

- Assisting photographers in culling large quantities of photos using ML/AI algorithms.
- Providing feedback on the objective quality of photos to help photographers improve their skills.
- Streamlining the post-processing workflow to save time and effort for photographers.

II. DEVELOPMENT PROCESS

As COSC345 is a paper with a far greater focus on practical experience than theoretical knowledge, the development process is largely self-directed, with groups expected to manage their own time and resources to complete the project within the semester timeframe. This section aims to detail the development process undertaken by Group 11.

A. Project Management

Group 11 adopted an agile development methodology, with two-week sprints and regular stand-up meetings. This allowed for team members to put agile methodologies into practice, further cementing the theoretical knowledge gained in previous papers.

The team utilised Taiga as a project management tool, as per the requirements of the course. This allowed for a centralised means of user-story management, sprint planning, and task assignment.

In practice, the agile methodology adopted by the team could have been followed more strictly. The act of breaking

down sprints into user stories for the project planning stage was generally well executed. However, the estimation of task sizes was often inaccurate, leading to sprints being either over- or under-committed. This is almost certainly due to the lack of experience of team members in estimating task sizes, and is an area which could be improved with more practice.

Additionally, stand-up meetings were generally productive provided that an agenda was followed, however this was not always the case. There are instances where meetings would proceed with no clear direction, leading to unproductive discussions and a lack of productive outcomes. This could have been mitigated by having a more structured approach to meetings, with either a clear agenda or objective set prior to the meeting.

B. Team Roles and Responsibilities

At the beginning of the project, the team operated under a decentralised, emergent leadership style. Where roles are not formally assigned, and individuals were expected to step up and lead tasks as needed. This model offered flexibility and the potential for shared ownership, allowing different members to contribute leadership depending on their personal expertise.

However, the lack of a clear project lead created ambiguity. Without a central point of accountability, the team struggled to establish direction, set priorities, and coordinate effectively. While this approach was able to better encourage both participation and inclusivity, it often led to team members looking to others to take charge, resulting in delays and inefficiencies, especially where decisive action was required.

Upon recognising these shortfalls in management structure, the team opted to transition to a more traditional hierarchical model as presented in COSC345 lectures. The team was divided into two pairs, each responsible for the front-end and back-end development respectively, and a designated project lead. This structure provided clearer accountability and a more defined chain of command, while still maintaining opportunities for collaboration and shared input.

This restructuring brought greater clarity and efficiency. The division of labour allowed tasks to progress in parallel, and the project lead provided much-needed direction to the project. Compared to the initial emergent model, this approach was more effective as it ensured both structure and flexibility.

One limitation, however, was that the project lead emerged through self-appointment rather than consensus, and their relative lack of experience occasionally impacted decision-making. The experience demonstrated that while decentralised leadership can be valuable, software projects often require a clearly defined leader — ideally one selected with regard to competence and team buy-in — to keep the group aligned, especially under time constraints.

For development the team used Gitbucket as a version control system, with each team member working on a local repository and then pushing changes to the remote.

C. Design Process

The design process for AutoCull involved the several stages, including requirements gathering, system architecture design,

and user interface design. With certain aspects of the project dictated by the project specifications provided.

Requirements gathering involved consulting with both actively working photographers and those with a keen interest in photography. This allowed for a better understanding of the needs of the target users. Key insights from requirement gathering included:

- Potential users did not want an application to replace the likes of photoshop.
- The photos should not be automatically culled, the user should have the final say, and the application should not update the local filesystem.
- The use of AI/LLM giving the photographer score and feedback on a collection was well received by potential customers.

System architecture design pulled on the prior knowledge of team members, as well as content throughout COSC345. The architecture was designed to be modular and extensible, allowing for future features to be added with minimal disruption to existing functionality.

The gathering of requirements through approaching actual users was a particularly valuable exercise, likely among the most valuable of the entire project. It provided a real-world context to the project, and allowed for a better understanding of the needs of the target users. This was particularly important given the niche nature of the application, as it ensured that the features developed were relevant and useful to photographers this application is meant for.

User interface design was approached through extensive research into existing post processing applications, as well as general UI/UX design principles. The goal was to create an interface that was both intuitive and efficient, allowing the target users to quickly learn the application through implementing familiar design patterns shared by other popular photography applications.

While there was initially some friction within the team regarding design decisions, where it was unclear whether a certain UI design would make sense in the context of this application, this was largely mitigated through gaining feedback from potential users. This feedback was invaluable in refining the design, and ensuring that the final product was both functional and intuitive to the end user. With the understanding that we wanted to create a desktop application, the team decided to use Python as the primary programming language, leveraging the Tkinter library for the user interface.

User interface design focused on creating a simple and intuitive interface, with a focus on usability and user experience. Wireframes and mockups were created using Figma, allowing for rapid prototyping and iteration based on feedback from potential users.

D. Implementation

E. Testing and Quality Assurance

ACKNOWLEDGMENT

The preferred spelling of the word “acknowledgment” in America is without an “e” after the “g”. Avoid the stilted

expression “one of us (R. B. G.) thanks ...”. Instead, try “R. B. G. thanks...”. Put sponsor acknowledgments in the unnumbered footnote on the first page.

REFERENCES

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