MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF KAZAKHSTAN

JSC "Kazakh-British Technical University"
Department of Computer Engineering

ADMITTED TO DEFENCE
Head of Computer
Engineering Department

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"____" _____ 2013

Student _____

Vadim Kotov

MASTER'S THESIS
XXXXXX – Information Systems

Theme: **"Game Mechanics for Stimulating High Performance of Project Participants"**

Almaty, 26th of May 2013

ASSIGNMENT
for graduation work planning

Student: V. Kotov

Major: Information Systems

Theme: "Mini-Game 'Simulation Of The Image Enhancement' And Visualization Of The Learning Scripts To The Lectures 'Computer Vision'"

Approved by: KBTU, act # 148-P dated 8th of October, 2010

Submission deadline: 23$^{\text{th}}$ of May 2011

Initial data to the project:
International standards (e.g. IEEE 1063-1987, ISO 12207, ANSI/IEEE 983, State Standard 34.201, etc.).

List of questions for graduate work development:

Analytical review, perspective on edutainment and usage of video games in education, examples, "DBB-Crackers" game mechanics

Designing, analysis of image enhancement techniques used in Computer Vision, opportunities for PDF-rendering in Unity game development environment, designing prototypes of "Image Enhancement Tool", "PDF-Reader", "PDF-Converter"

Development, the "Image Enhancement Tool" with following functionality:

- Custom LUT/transfer function based image modification (with complex logical functions available)
- Threshold
- Histogram equalisation

"PDF-Reader" and "PDF-Converter" implementation

Application and experiments, testing of "Image Enhancement Tool", application of thesis results to production: possible challenges, benefits and opportunities

List of diploma project advisers in connection with the diploma paper sections:

Section	**Adviser, department**
The economic part	Yanovskaya O.A., "Department of Economics and Management"
Labour protection part	Rakhmanova Zh. T., "Department of Petrouleum Engineering"

Date of assignment receipt: 10th of January 2010

Supervisors — Prof. Dr. Nailja Luth
c.t.s., docent R.M. Duzbayeva

Student — Vadim Kotov

"____" _____ 2011

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ADMITTED TO DEFENCE

Head of Computer
Engineering Department
c.t.s., assistant professor

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B. K. Dlimbetov

"____" _____ 2011

SCHEDULE
for graduation work

Student: V. Kotov

Major: Information Systems

Theme: "Mini-Game 'Simulation Of The Image Enhancement' And Visualization Of The Learning Scripts To The Lectures 'Computer Vision'"

Supervisors: Prof. Dr. Nailja Luth, Senior Lecturer R. M. Duzbayeva

Type of work	**Deadline**
1. Diploma title and supervisor settlement.	October

Type of work	Deadline
1. Arrival at HAW-AW[1] university 2. Introduction to the "DBB-Crackers" game. Discussion of the project assignment 3. Definition of goals and objectives of the project. Clarification of goals and objectives priority 4. Formulation of research objectives and its characteristics 5. Analytical review: perspective on edutainment and usage of video games in education, examples, "DBB-Crackers" game mechanics 6. Familiarisation with software (Unity) and game prototype	January
1. Analysis of image enhancement techniques and algorithms of used in Computer Vision, opportunities for PDF-rendering in Unity game development environment 2. Designing prototypes of "Image Enhancement Tool", "PDF-Reader", "PDF-Converter" 3. Gaining necessary background information of the thesis papers	April

[1]University of Applied Sciences Amberg-Weiden

Type of work	**Deadline**
1. Development of algorithms, specific for the target platform 2. Testing the software on possible logical errors 3. Experimenting and comparing the results of the work of Image Enhancement Tool with such software, as Adobe Photoshop. Summing up appropriate conclusion	March
1. Submission of the results of the project to the University of Applied Sciences Amberg-Weiden. Finding possible issues and benefits. 2. Preparation the graphic material for the thesis report 3. Preparation of the explanatory note 4. Presentation of the thesis project	May

Head of Computer Engineering Department

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B.K.Dlimbetov

Abstract

Here you should write your Abstract. Use this command to see the no of the last page: 24. Compact list:

- Item 1
- Item 2

Contents

List of Figures

List of Tables

Introduction

Dean Spitzer's report on work attitudes.

Motivation for IT/creative people (Drive). Odds of old motivational strategy. Experiment with children and drawing.

A list of problems, connected to startups / estimation, etc.

Market of productivity apps.

The reason to make another app, despite the hype: a lot of similar apps, several "make things different", project managers' "secret knowledge".

1. Project management techniques for small teams and startups

project management in the past ¿ evolving technologies require new methods?

project management is everywhere ¿ importance of personal pm

Benefits of understanding what is project management ¿ education and automatisation ¿ different approach required

Project management for startups and small teams, iterative approach

1.1 Agile methods

A group of software development methods.

Contrast to waterfall model.

Agile manifesto.

Agile methods.

Suitability.

1.2 Scrum

Agile software development framework for managing software projects.

A little bit of history

Roles, Sprint, Meetings, Artifacts (Deliverables)

1.3 RAD – Rapid Application Development

Software development methodology

Phases of RAD

1.4 TDD – Test-Driven Development

Software development process (methodology)

Cycle

Doesn't include other business goals

1.5 FDD – Feature-Driven Development

Iterative and incremental software development process (methodology)

Overview

Milestones

Metamodel

1.6 RUP – Rational Unified Process

Iterative software development process framework

RUP building blocks

Four project lifecycle phases

Best practises

1.7 Lean

Merge of lean manufacturing and lean IT principles.

What is lean manufacturing?

What is lean IT?

Lean principles

1.8 Effectiveness of RAD and Agile methodics

A table from RAD wikipedia article

1.9 Project management goals for small teams and start-ups

Problem: Software development frameworks do not include business goals. They oriented on how to build a product, but they bad at sales?

Why should startups and small-teams should be sales-oriented or problem-solving oriented, but not technology oriented at first place?

The general goal of project management is collecting feedback in order to manage available resources to be in time. Why? – Flow, will be considered later.

1.9.1 PERT and Monte-Carlo simulation

One of the method to collect feedback is PERT.

Statistical tool, used in PM, that is designed to analyse and represent the tasks involved in completing a given project.

Monte-Carlo seeks for potential troubles and bottlenecks early.

1.9.2 Teams without project managers

Importance for collaboration software (like basecamp) to have it's own methodology and provide subtle education for its users.

The bad: hard to adopt a different methodology. No room for creativity?

The good: potentially more effective for beginners.

2. Team-motivation strategies and personal productivity

2.1 "Action Method" application and concept behind

2.2 Gamification

2.2.1 Game mechanics list

2.2.2 Appropriate game mechanics for the basic project management

KPI – Key Performance Indicator

2.3 Goal commitment formula

2.4 Motivation in Daniel Pink's "Drive"

2.5 Mihaly Csikszentmihalyi's concept of "Flow"

2.6 Reconsidering gamification for productivity

2.7 General guidelines by XXXXXX

3. Productivity mobile applications analysis

3.1 Popular applications and their description

3.2 Game mechanics in use

3.3 What to learn from productivity apps

3.3.1 Integration

3.3.2 General UI patterns and workflow

4. Methodology for stimulating high-performance of project participants

4.1 Team-wide productivity

4.2 Personal productivity

4.3 Automatisation

5. Building productivity mobile application

5.1 Abstractions and games

5.1.1 Concept of time limitation

5.1.2 Tetris influence

5.2 Game mechanics in use

5.3 Feedback

5.4 Prototype

5.5 Development plan

Conclusion

Bibliography

A. Code Snippets

A.1 Code

code/somecode.cs