

Nutan Maharashtra Vidya Prasarak Mandal's (NMVPM's) **NUTAN MAHARASHTRA INSTITUTE OF** ENGINEERING AND TECHNOLOGY (NMIET)

Under Administrative Support - Pimpri Chinchwad Education Trust (PCET)

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Affiliated to SPPU

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DEPARTMENT OF COMPUTER ENGINEERING

INNOVATIVE TEACHING AND LEARNING

AY-2022-23 (SE)

Semester	IV
Subject Coordinator	Prof. Rohini Hanchate
Methodology	V LAB /simulation
Activity	Session on COCOMO Estimation model
Objective	To Estimate the program complexity and effort required
Outcome	 Students have gain the knowledge of categorized projects using COCOMO, and estimate effort and development time required for a project Estimate the program complexity and effort required to recreate it using Halstead's metrics

Description:

Project Estimation Techniques

A software project is not just about writing a few hundred lines of source code to achieve a particular objective. The scope of a software project is comparatively quite large, and such a project could take several years to complete. However, the phrase "quite large" could only give some (possibly vague) qualitative information. As in any other science and engineering discipline, one would be interested to measure how complex a project is. One of the major activities of the project planning phase, therefore, is to estimate various project parameters in order to make proper decisions. Some important project parameters that are estimated include:

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Project size: What would be the size of the code written say, in number of lines, files, modules?

Cost: How much would it cost to develop a software? A software may be just pieces of code, but one has to pay to the managers, developers, and other project personnel.

Duration: How long would it be before the software is delivered to the clients?

Effort: How much effort from the team members would be required to create the software?

COCOMO: COCOMO (Constructive Cost Model) was proposed by Boehm. According to him, there could be three categories of software projects: organic, semi detached, and embedded. The classification is done considering the characteristics of the software, the development team and environment. These product classes typically correspond to application, utility and system programs, respectively. Data processing programs could be considered as application programs. Compilers, linkers, are examples of utility programs. Operating systems, real-time system programs are examples of system programs. One could easily apprehend that it would take much more time and effort to develop an OS than an attendance management system.

Basic COCOMO Model

The basic COCOMO model helps to obtain a rough estimate of the project parameters. It estimates effort and time required for development in the following way:

Effort = a * (KDSI)bPMTdev = 2.5 * (Effort)c Monthswhere

- KDSI is the estimated size of the software expressed in Kilo Delivered Source Instructions
- a, b, c are constants determined by the category of software project
- Effort denotes the total effort required for the software development, expressed in person months (PMs)
- Tdev denotes the estimated time required to develop the software (expressed in months)

MCQ's

- 1. According to the COCOMO model, a project can be categorized into
- 3 types
- 5 types
- 5 types
- No such categorization
- 2. In Intermediate COCOMO model, Effort Adjustment Factor (EAF) is derived from the effort multipliers by
 - Adding them
 - Multiplying them
 - Taking their weighted average
 - Considering their maximum
- 3. Project metrics are estimated during which phase?

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- Planning
- Design
- Development
- 4. Complete COCOMO considers a software as a
 - Homogeneous system
 - Heterogeneous system
- 5. Consider you are developing a web application, which would make use of a lot of web services provided by Facebook, Google, Flickr. Would it be wise to make estimates for this project using COCOMO?
 - Yes, of course
 - Not at all

Reference: http://vlabs.iitkgp.ernet.in/se/2/simulation/

Course Coordinator

Principal

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Program Coordinator



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INNOVATIVE TEACHING AND LEARNING

AY-2022-23 (BE)

Semester	VIII
Subject Coordinator	Dr. Saurabh Saoji
Methodology	Virtual Lab
Activity	Image Segmentation on Virtual Lab
Objective	To understand the challenges in extracting objects/regions of interest from a given image.
Outcome	Students learn the concepts of histogram and image Segmentation

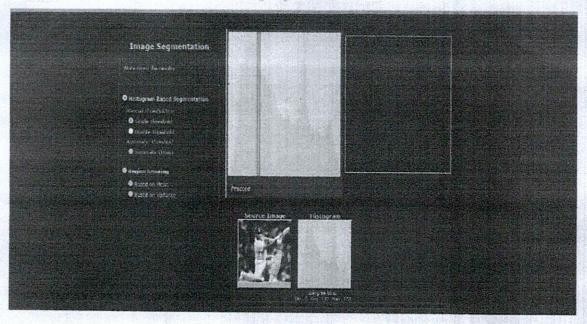
Description:

Image segmentation is a common task which arises in many situations such as extracting a face or a character in a text from an image before performing automatic recognition. Generally, it is used to separate the foreground pixels belonging to the object(s) of interest, from the background pixels. Segmentation aims to partition a given image into a set of regions having following properties: connectivity and homogeneity in terms of color or texture.

An object or region can be characterized using multiple low-level features such as brightness, colour, texture, etc. In this experiment, we will restrict ourselves to objects defined by brightness. We will aim to partition a given image into two (foreground and background) and study two techniques namely, histogram-based thresholding and region growing, to perform this partitioning. Students have implemented all three types of Graph traversals in the virtual lab.

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Reference: https://cse19-iiith.vlabs.ac.in/exp/image-segmentation/simulation.html

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