### C:\Users\user\Desktop\estü7.jpg

ESKİŞEHİR TECHNICAL UNIVERSITY

FACULTY OF ENGINEERING

**BIM485**

**RESEARCH IN COMPUTER SCIENCE-I**

PROJECT REPORT

Şerif Fırat KARA

**(35857183538)**

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**INSTRUCTOR : ÖZGÜR ÖZŞEN**

# **ABSTRACT**

Image processing has been gaining value in many areas of our life for some time. Already industry, logistics, game, marketing, economy, health, aviation, media and so on. used in areas. In this project, it is aimed to measure how much text is included in the video with the recognition of text from the image to be recognized from the video by using EmguCV library in the same way. In this way, the companies in the media will be able to follow their investments through advertising

**Keywords:** Image Recognition,New Technology,Media,EmguCV

# **ÖZET**

Görüntü işleme bir süredir hayatımızın birçok alanında değer kazanmaya başlamıştır. Şimdiden endüstri, lojistik, oyun, pazarlama, ekonomi, sağlık, havacılık,medya vb. alanlarda kullanılmaktadır. Özellikle doğru algoritmalar kullanılarak görüntü işleme sayesinde hayatımızın birçok alanında insan gücünden tasarruf edilebilir. Bu projede EmguCV kütüphanesi kullanılarak videodan tanınacak görüntüden text tanınması ile söz konusu textin videoda ne kadar yer aldığı,aynı şekilde belirli bir şeklin bir videoda ne kadar yer aldığını ölçmek amaçlanmıştır.Bu sayede medyada yer alan şirketler reklam aracılığıyla yaptıkları yatırımları takip edebilecektir.Kullanılabilirlik açısından

**Anahtar Kelimeler:**Görüntü işleme, Yeni teknoloji,Medya,EmguCV

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**1.INTRODUCTION**

This desktop-based image processing project. It is designed and implemented for research and educational purpose with EmguCV. Everyone who has an desktop-based system will be able to use the application.

## **1.1.Project Description**

The goal of the project is to measure text and shape from video. When video start, measurement is start.First capturing video or camera process, after that video is split up frames.Then text exraction on every frame and text recognition an every frame.After this processes I compare every frame with my target frame and result is printed on the final screen.Another case is a;We may have particular target image and we may want compare particular frame of video.Our project will accomlish this case also. We can use camera or any video you want(you should choose the directory),there is a form app for inside catching video and camera file .You can see start,stop and pause process and capturing any video you want.

# **2. REQUIREMENT ANALYSIS**

## 2.1 Functional Requirements

* Project include image recognition,text recognition,text exraction from video.
* Project will support english language.
* This project provide comparison with target image. Users can use this feature their exlusive image.
* To increase application usage,every week developed extra features.(e.g cropping and segmented image)
* To advance this application in future; face detection can be add.

## 2.2 Non- Functional Requirements

* **Performance**

One of the main goals of this project is to provide maximum performance to the user. I am using EmguCV framework which are statistically best and richest software to provide this purpose. Visual Studio is the most stable IDE for EmguCV. The graphics, functionality and utilities used in the application will be designed to be optimized for the application.

* **Scalability**

This project is a open source.Also EmguCV is open source which can be seen on github.Everybody can use and develop who interest this project. That's why scalability is high.

* **Security**

Because our project does not require internet connection and is a single user, there is no security measure to take.

* **Maintainability**

With the feedback İ may receive from users, the bugs of the application, if any, the optimization problems will be fixed or added feature with the next update. Additional features that may come along with updates will ensure the maintainability of the application.

* **Usability**

The use of our project will be simple and basic for the user. The simple and clear menu design with handy interface usability of this project is so high that proof of goal-orientation

* **Availability**

Because our project does not require internet connection, the user will be able to use it actively without any other requirement as long as he installs it on the computer. At the end of the fall semestre, projects full version will be on the github.

# **3. USED TECHNOLOGIES**

**3.1 Microsoft Visual Studio**

**Microsoft Visual Studio** is an [integrated development environment](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW50ZWdyYXRlZF9kZXZlbG9wbWVudF9lbnZpcm9ubWVudA) (IDE) from [Microsoft](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0). It is used to develop [computer programs](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29tcHV0ZXJfcHJvZ3JhbQ), as well as [websites](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2ViX3NpdGU), [web apps](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2ViX2FwcA), [web services](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2ViX3NlcnZpY2U) and [mobile apps](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTW9iaWxlX2FwcA). Visual Studio uses Microsoft software development platforms such as [Windows API](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2luZG93c19BUEk), [Windows Forms](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2luZG93c19Gb3Jtcw), [Windows Presentation Foundation](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2luZG93c19QcmVzZW50YXRpb25fRm91bmRhdGlvbg), [Windows Store](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2luZG93c19TdG9yZQ) and [Microsoft Silverlight](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1NpbHZlcmxpZ2h0). It can produce both [native code](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWFjaGluZV9jb2Rl) and [managed code](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWFuYWdlZF9jb2Rl).

Visual Studio includes a [code editor](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29kZV9lZGl0b3I) supporting [IntelliSense](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW50ZWxsaVNlbnNl) (the [code completion](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29kZV9jb21wbGV0aW9u) component) as well as [code refactoring](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29kZV9yZWZhY3RvcmluZw). [The integrated debugger](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1Zpc3VhbF9TdHVkaW9fRGVidWdnZXI) works both as a source-level debugger and a machine-level debugger. Other built-in tools include a [code profiler](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHJvZmlsaW5nXyhjb21wdXRlcl9wcm9ncmFtbWluZyk), forms designer for building [GUI](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvR1VJ) applications, [web designer](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2ViX2Rlc2lnbmVy), [class](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2xhc3NfKGNvbXB1dGluZyk) designer, and [database schema](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRGF0YWJhc2Vfc2NoZW1h) designer. It accepts plug-ins that enhance the functionality at almost every level—including adding support for [source control](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvU291cmNlX2NvbnRyb2w) systems (like [Subversion](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvU3VidmVyc2lvbl8oc29mdHdhcmUp) and [Git](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvR2l0)) and adding new toolsets like editors and visual designers for [domain-specific languages](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRG9tYWluLXNwZWNpZmljX2xhbmd1YWdl) or toolsets for other aspects of the [software development lifecycle](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvU29mdHdhcmVfZGV2ZWxvcG1lbnRfbGlmZWN5Y2xl) (like the [Team Foundation Server](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvVGVhbV9Gb3VuZGF0aW9uX1NlcnZlcg) client: Team Explorer).

Visual Studio supports 36 different [programming languages](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHJvZ3JhbW1pbmdfbGFuZ3VhZ2U) and allows the code editor and debugger to support (to varying degrees) nearly any programming language, provided a language-specific service exists. Built-in languages include [C](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ18ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up),[[6]](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1Zpc3VhbF9TdHVkaW8jY2l0ZV9ub3RlLTY) [C++](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQyUyQiUyQg), [C++/CLI](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQyUyQiUyQi9DTEk), [Visual Basic .NET](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvVmlzdWFsX0Jhc2ljXy5ORVQ), [C#](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ19TaGFycF8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up), [F#](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRl9TaGFycF8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up),[[7]](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1Zpc3VhbF9TdHVkaW8jY2l0ZV9ub3RlLTc) [JavaScript](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSmF2YVNjcmlwdA), [TypeScript](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvVHlwZVNjcmlwdA), [XML](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvWE1M), [XSLT](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvWFNMVA), [HTML](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSFRNTA), and [CSS](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2FzY2FkaW5nX1N0eWxlX1NoZWV0cw). Support for other languages such as [Python](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHl0aG9uXyhwcm9ncmFtbWluZ19sYW5ndWFnZSk),[[8]](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1Zpc3VhbF9TdHVkaW8jY2l0ZV9ub3RlLTg) [Ruby](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUnVieV8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up), [Node.js](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTm9kZS5qcw), and [M](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTVVNUFM) among others is available via [plug-ins](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUGx1Zy1pbl8oY29tcHV0aW5nKQ). [Java](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSmF2YV8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up) (and [J#](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSl9TaGFycA)) were supported in the past.

The most basic edition of Visual Studio, the Community edition, is available free of charge.

The currently supported Visual Studio version is 2017. Microsoft announced 2019 on June 6, 2018, with its release timing to be shared "in the coming months," promising "to deliver ... quickly and iteratively."

## **3.2 EmguCV**

[**Emgu CV**](http://www.emgu.com/wiki/index.php/Emgu_CV) is a cross platform .Net wrapper to the [OpenCV](http://www.emgu.com/wiki/index.php/OpenCV) image processing library. Allowing [OpenCV](http://www.emgu.com/wiki/index.php/OpenCV) functions to be called from .NET compatible languages such as C#, VB, VC++, IronPython etc. The wrapper can be compiled by Visual Studio, Xamarin Studio and Unity, it can run on Windows, Linux, Mac OS X, iOS, Android and Windows Phone.

[Emgu CV](http://www.emgu.com/wiki/index.php/Emgu_CV) is written entirely in C#. The benefit is that it can be [compiled in Mono](http://www.emgu.com/wiki/index.php/Compiling_with_Monodevelop) and therefore is able to run on any platform Mono supports, including iOS, Android, Windows Phone, Mac OS X and Linux. A lot of efforts has been spent to have a pure C# implementation since the headers have to be ported, compared with managed C++ implementation where header files can simply be included. But it is well worth it if you see [Emgu CV running on Fedora 10](http://www.emgu.com/wiki/index.php/Compiling_with_Monodevelop)! Plus it always gives you the comfort knowing that your code is cross-platform.

Other Advantages;

* [Image class with Generic Color and Depth](http://www.emgu.com/wiki/index.php/Working_with_Images#Depth_and_Color_as_Generic_Parameter)
* [Automatic garbage collection](http://www.emgu.com/wiki/index.php/Working_with_Images#Automatic_Garbage_Collection)
* [XML Serializable Image](http://www.emgu.com/wiki/index.php/Working_with_Images#XML_Serialization)
* [XML Documentation and intellisense support](http://www.emgu.com/wiki/index.php/Tutorial#Intellisense_in_Visual_Studio)
* The choice to either use the [Image class](http://www.emgu.com/wiki/index.php/Tutorial#Working_with_images) or [direct invoke functions](http://www.emgu.com/wiki/index.php/Tutorial#Function_Mapping_-_Emgu.CV.CvInvoke) from [OpenCV](http://www.emgu.com/wiki/index.php/OpenCV)
* [Generic operations](http://www.emgu.com/wiki/index.php/Working_with_Images#Generic_Operation)on image pixels

## **3.3 OpenCV**

**OpenCV** (*Open source computer vision*) is a [library of programming functions](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTGlicmFyeV8oY29tcHV0aW5nKQ) mainly aimed at real-time [computer vision](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29tcHV0ZXJfdmlzaW9u).[]](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvT3BlbkNWI2NpdGVfbm90ZS0x)Originally developed by [Intel](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW50ZWxfQ29ycG9yYXRpb24), it was later supported by [Willow Garage](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvV2lsbG93X0dhcmFnZQ) then Itseez (which was later acquired by Intel). The library is [cross-platform](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ3Jvc3MtcGxhdGZvcm0) and free for use under the [open-source](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvT3Blbi1zb3VyY2U) [BSD license](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQlNEX2xpY2Vuc2U).

OpenCV supports the [deep learning](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRGVlcF9sZWFybmluZw) frameworks [TensorFlow](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvVGVuc29yRmxvdw), [Torch](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvVG9yY2hfKG1hY2hpbmVfbGVhcm5pbmcp)/[PyTorch](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHlUb3JjaA) and [Caffe](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2FmZmVfKHNvZnR3YXJlKQ). OpenCV is written in [C++](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQyUyQiUyQg) and its primary interface is in C++, but it still retains a less comprehensive though extensive older [C interface](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ18ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up). There are bindings in [Python](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUHl0aG9uXyhwcm9ncmFtbWluZ19sYW5ndWFnZSk), [Java](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSmF2YV8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up) and [MATLAB](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTUFUTEFC)/[OCTAVE](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvR05VX09jdGF2ZQ). The API for these interfaces can be found in the online documentation. Wrappers in other languages such as [C#](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ19TaGFycF8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up), [Perl](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUGVybA), [Ch](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2hfKGNvbXB1dGVyX3Byb2dyYW1taW5nKQ), [Haskell](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSGFza2VsbF8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up) and [Ruby](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvUnVieV8ocHJvZ3JhbW1pbmdfbGFuZ3VhZ2Up) have been developed to encourage adoption by a wider audience.

All of the new developments and algorithms in OpenCV are now developed in the C++ interface.

## **3.4 C#**

**C#**[ is a general-purpose, [multi-paradigm programming language](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTXVsdGktcGFyYWRpZ21fcHJvZ3JhbW1pbmdfbGFuZ3VhZ2U) encompassing [strong typing](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvU3Ryb25nX3R5cGluZw), [imperative](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW1wZXJhdGl2ZV9wcm9ncmFtbWluZw), [declarative](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRGVjbGFyYXRpdmVfcHJvZ3JhbW1pbmc), [functional](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRnVuY3Rpb25hbF9wcm9ncmFtbWluZw), [generic](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvR2VuZXJpY19wcm9ncmFtbWluZw), [object-oriented](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvT2JqZWN0LW9yaWVudGVkX3Byb2dyYW1taW5n) ([class](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ2xhc3NfKGNvbXB1dGVyX3NjaWVuY2Up)-based), and [component-oriented](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29tcG9uZW50LWJhc2VkX3NvZnR3YXJlX2VuZ2luZWVyaW5n) programming disciplines. It was developed around 2000 by [Microsoft](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0) within its .NET initiative and later approved as a standard by [Ecma](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvRWNtYV9JbnRlcm5hdGlvbmFs) (ECMA-334) and [ISO](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvSW50ZXJuYXRpb25hbF9Pcmdhbml6YXRpb25fZm9yX1N0YW5kYXJkaXphdGlvbg)(ISO/IEC 23270:2006). C# is one of the programming languages designed for the [Common Language Infrastructure](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQ29tbW9uX0xhbmd1YWdlX0luZnJhc3RydWN0dXJl).

C#'s development team is led by [Anders Hejlsberg](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvQW5kZXJzX0hlamxzYmVyZw). The most recent version is C# 7.3, which was released in 2018 alongside [Visual Studio](http://www.wikizeroo.net/index.php?q=aHR0cHM6Ly9lbi53aWtpcGVkaWEub3JnL3dpa2kvTWljcm9zb2Z0X1Zpc3VhbF9TdHVkaW8) 2017 version 15.7.2.

For example The CvInvoke class provides a way to directly invoke [OpenCV](http://www.emgu.com/wiki/index.php/OpenCV) function within .NET languages. Each method in this class corresponds to a function in [OpenCV](http://www.emgu.com/wiki/index.php/OpenCV) of the same name. For example, a call to

IntPtr image = CvInvoke.cvCreateImage(**new** System.Drawing.Size(400, 300), CvEnum.IPL\_DEPTH.IPL\_DEPTH\_8U, 1);

is equivalent to the following function call in C

IplImage\* image = cvCreateImage(cvSize(400, 300), IPL\_DEPTH\_8U, 1);

Both of which create a 400x300 of 8-bit unsigned grayscale image.

# **What I Have Done So Far?**

1. Project subject choosen. (Finished)

2. Research about image recognition and its SDK’s. (Started beginning of semester and still ongoing)

3. Research about possible project ideas and what have people done so far about it.

4. Determining project requirements .(Finished)

5. Setting up development environment for image processing (Finished)

6. Designing inteface an research about useful frameworks.(Still ongoing)

7. Finished jobs commits on github.(will be updated)

# **4.CONCLUSIONS**

In this project, I aim to learn how designing, implementation and development processes work in the ever-developing and demanding image recognition development. Especially, after Industry 4.0 and its standards featured, importance of image recognition is understood. Military purpose or entertainment purpose whatever purpose it is,image recognition is very useful and open t development field.I believe computer vision will gain importance every second and I wish to improve my work and prove myself on this field.

I am designing all the components in my application like a professional job. Also, by creating all algorithms and structures by myself, I wish to be in finished project at the end of the semester.

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