

Art of Competition

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Graduation Project Team







Morse glasses: an IoT communication system based on Morse code for users with speech impairments

Nayera Tarek, Mariam Abo Mandour, Nada El-Madah, Reem Ali, Sara Yahia, Bassant Mohamed, Dina Mostafa & Sara El-Metwally 

Computing 104, 789–808 (2022) | Cite this article

IJCSNS International Journal of Computer Science and Network Security, VOL.22 No.3, March 2022

ucsc-genomic-api: A Python Wrapper of UCSC Genome Browser RESTful API

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Salma Ahmed¹, and Sara El-Metwally^{2†},

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Article | Open Access | Published: 17 May 2023

scientific reports

Blink-To-Live eye-based communication system for users with speech impairments

Mohamed Ezzat, Mohamed Maged, Youssef Gamal, Mustafa Adel, Mohammed Alrahmawy & Sara El-Metwally 

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

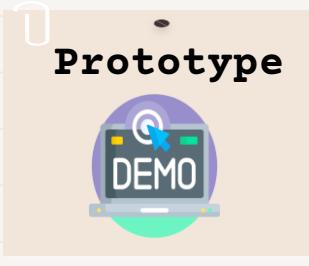
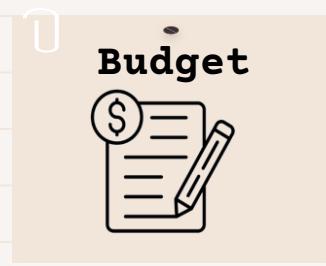
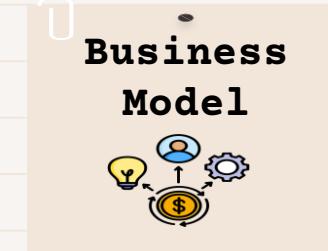
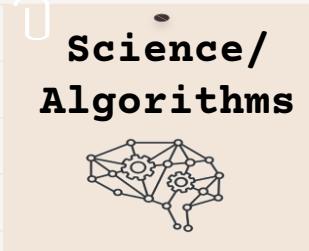


Feedbacks

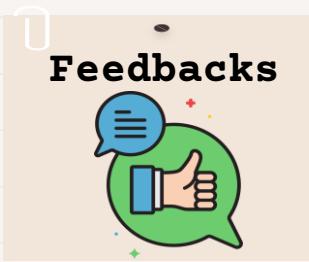
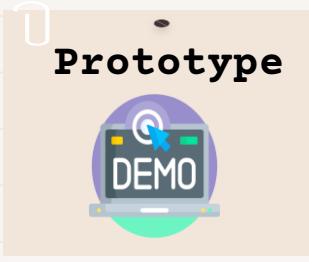
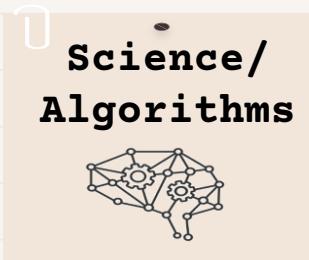


Paper





- Problem Definition (What)
- Motivations (Why)
- Methodology (How)
- Teams (Who)
- Timeline (When)
- Budget (Cost)
- Significance
- Challenges
- SW/HW Resources
- BMC
- Previous Solutions
- Future Works
- References



- ✓ Contract with stakeholders
- ✓ Read Competition Rules
- ✓ Fit with Competition Theme
- ✓ Be specific and Clear
- ✓ No standards
- ✓ Use Templates
- ✓ Use Chatgpt for rephrasing

ووصف عن المشروع باللغة العربية فيما لا يزيد عن ٢٥٠ كلمة :

كما ذكر في رؤية مصر 2030 "يجب أن يتمتع جميع المصريين بحياة صحية آمنة من خلال نظام رعاية صحية متكامل وسهل الوصول وعالي الجودة وشامل" ، كان خطط دائمة بأن تكون جزءاً من هذه الرؤية وستنتهي من معرفتنا التكنولوجية وستغنا بالطموح لتطوير مثل هذا النظام الصحي الكامل. بدأنا بالجزء الأكبر والأكثر حساسية في جسم الإنسان وهو الدم ، وفقاً لبناء نظام رعاية صحية تشخيصي كامل قادر على تشخيص أكثر من 620 مرض جلدي بدقة تفاصيل 98٪. يعتمد النظام على الذكاء الاصطناعي ونمذج التعليم العميق التي تم تدريبيها على اكتشاف أنواع مختلفة من الأمراض الجلدية وأيضاً مساعدة الطبيب في عملية إتخاذ القرار بشأن قرارات الجلد التشخيصية والعلاجية. يخاف المريض فقط إلى فتح الكابين الخاصة بهاته لمسح منطقة الجلد المصابة والإجابة على بعض الأسئلة ويسقيق تطبيق الهاتف المحمول الخاص بالبرنامج بإظهار التشخيص الجلدي وطلب العلاج والاتصال بطبب الأمراض الجلدية في حالات الطوارئ. أيضاً يقوم المتردح المتخفيين عن العلاجات الوقائية والنصائح والإرشادات الطبية للعناية بالجلد والحفاظ على البشرة بصفة عامة. كذلك يتيح التطبيق معلومات عن الأطباء المتخصصين طبقاً لموقع المريض الجلدي ويساعد المريض في متابعة حالته الصحية وتقييم تقارير دورية للطبيب المختص إن لزم الأمر. أيضاً يقوم التطبيق بالاتصال مع أقرب مسندية في موقع المريض الجلدي ويقوم بطلب النواة المناسب بناء على التشخيص الذي تم تحديده من قبل النظام. نحن نخطط لتوسيع النظام ليشمل أعضاء أخرى من جسم الإنسان والجلد هو مجرد نقطة انطلاق لنظام رعاية صحية متكامل والذي سيحقق رؤية مصر 2030.

اذكر الهدف العام من المشروع والمشكلة التي يقوم هذا المشروع بمعالجتها مع إرفاق صورة للنموذج الأولي:

يهدف المشروع إلى تطوير نظام رعاية صحية يستخدم تقنيات الذكاء الاصطناعي وتقنيات تعلم الآلة،
اذكر منهجة العمل موضحاً كيفية تحقيق الأهداف والمخرجات والعادات من التنفيذ:

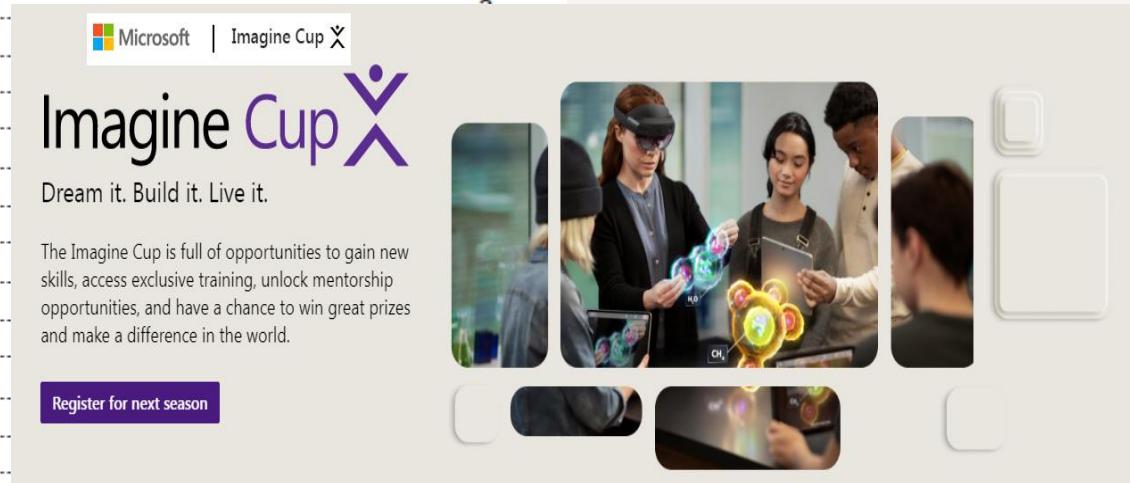
التكاليف	المخرجات / العائد	مدة النشاط	النشاط	الهدف
جهاز حاسوب يعمل بكفاءة وإمكانات عالية لبرمجة وتدريب الموديل	المخرجات: ١-تطوير موديل قادر على تحديد ٢٣ نوع من أنواع الأمراض الجلدية. ٢-تطوير موديل قادر على تشخيص الأمراض الجلدية على مستوى الأفراد. ٣-نسبة دقة التشخيص ٩٨٪. العادات: ٤-بيانات موديل قادر على تشخيص ٢٣ نوع من أنواع الأمراض الجلدية التي يمكن بمتابعة نظام تشخيصي متكامل مستقل قادر على التشخيص باستخدام لغة البرمجة باستقلالية تامة عن الطبيب وأيضاً داعم ومساند للطبيب في إتخاذ القرار للحد من الأضرار الناتجة عن أخطاء التشخيص الطبي المختلفة ومعالجتها.	٦ أشهر	١-التواصل مع أطباء الأمراض الجلدية لمعرفة الأنواع المختلفة والتصنيفات المختلفة للأمراض. ٢-قراءة أحد الأبحاث المتخصصة في مجال الذكاء الإصطناعي وتقنيات تعلم الآلة والمستخدمة في تشخيص الأمراض الجلدية. ٣-عمل بحث شامل عن قواعد البيانات المختلفة والتي تحتوي على كمية هائلة من الصور الجلدية. ٤-عمل تقنيات للبيانات ومعالجتها حتى يسهل للموديل التعامل معها والتعرف عليها بستخدام لغة البرمجة بايتون. ٥-تجهيز وكتابة كود الموديل عن طريق تحديد مدخلاته وعدد طبقاته بإستخدام لغة البرمجة بايتون. ٦-عمل تدريب وإختبار للموديل لتحديد كفائته وجودة دقة في التشخيص.	بناء موديل ذكاء الإصطناعي قادر على تشخيص أكثر من ٦٢٠ مرض جلدي بدقة ١٠٠٪. يتيح التطبيق كاميرا الهاتف ويقوم المريض بعمل سحب لمنطقة الجلد المصابة ومن ثم يقوم ظهور للمرض وأماكن ظهوره ومن ثم يقوم التطبيق بإظهار التشخيص المناسب طبقاً لما فحنا بتقليده له تم تدريبه على أكثر من ٦٢٠ مرض جلدي في مختلف أنحاء الجسم. أيضاً يقوم التطبيق بإظهار مجموعة حسب درجة خطورة المرض وأيضاً يقوم بالتواصل مع أقرب مسندية وأقرب طبيب لإتمام عملية العلاج

المخرجات الرئيسية من المشروع والمستفيد النهائي :

المخرجات الأساسية: تطبيق هاتف محمول قادر على تشخيص الأمراض الجلدية وتقييم الإرشادات الصحية وسهولة التواصل مع الأطباء والمرضى والصيادلات. أيضاً نظام خادم وسيط لدعم القرار الطبي وتقييم مجموعة من الخدمات مثل تغذى بيانات المرضى والآباء والأبوة.
المستفيد النهائي: المواطن المصري وأطباء الجلدية والتجهيز والصيادلات ومنافع الأدوية ومستحضرات التجميل ومنتجات العناية بالبشرة.

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The image shows a screenshot of the Microsoft Imagine Cup website. At the top left is the Microsoft logo and the text "Imagine Cup X". Below it is a large purple "Imagine Cup" logo with a stylized "X" icon. The tagline "Dream it. Build it. Live it." is centered below the logo. To the right is a photograph of three people wearing VR headsets, interacting with a virtual interface displaying molecular structures (H2O and CH4). Below the main image are four smaller thumbnail images showing various scenes related to technology and innovation. A purple button at the bottom left says "Register for next season".

DELL Technologies

Section 1: Refined Project Description (approx. 1/2 a page) you need to consider that the reviewer hasn't seen your 1st phase abstract and you need to brief him/her with all the below information.

- 1.1. The problem addressed specifically in this project and its importance.
- 1.2. Project scope and expected outcome
- 1.3. List and explanation of any changes/adjustments made relative to the abstract report.

Section 2: Refined Project Plan (approx. 1 page)

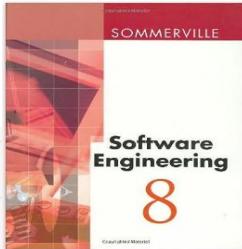
- 2.1. Detailed schedule and milestones (clearly show current status, progress, and issues)
- 2.2. Team structure and detailed roles/responsibilities of each member
- 2.3. Contingency and risk mitigation plan

The purpose of the plan is to reduce the damage of the risk when it occurs. A good contingency plan should include any event that might disrupt operations.

Section 3: System Requirements (approx. 1 page)

- 3.1. Requirements Elicitation Process:
 - a) Description of the processes that were actually used for: requirements elicitation, analysis, prioritization, and change management.
 - b) List and categorization of system stakeholders, users, and clients.
 - c) Challenges encountered [and lessons learned] during the requirements gathering, analysis, and prioritization phases
- 3.2. System Requirements List:
 - a) Functional requirements
 - b) Non-functional requirements

Section 4: System Design (approx. 1 page)



Dell Technologies' Envision the Future Competition 2023 for Senior Undergraduate Students from the Middle East and Africa (USD 12,000 Prize)

Section 4: System Design (approx. 1 page)

- 4.1. High level system architecture, data flows, etc
- 4.2. User interfaces, if any
- 4.3. Algorithmic components, if any
- 4.4. Innovative aspects of the design

Section 5: System Implementation (approx. 1 page)

- 5.1. Hardware and software platforms
- 5.2. Hardware and software development tools, languages, etc
- 5.3. Modules/components acquired from external sources (e.g., open source, licensed commercial/trial products, university/departmental resource libraries, etc)
- 5.4. Innovative aspects of the implementation

Section 6: Other Relevant Issues and Challenges (approx. 1/2 a page)

- 6.1. Technical

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

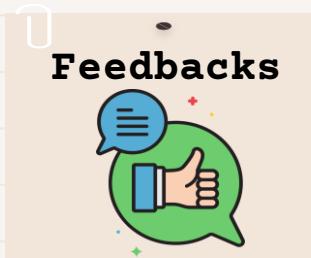
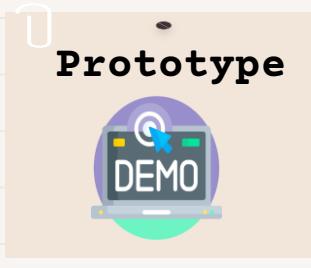
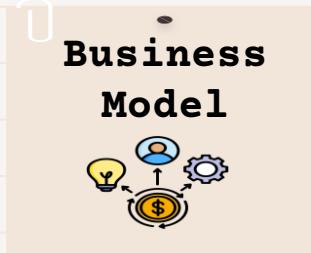
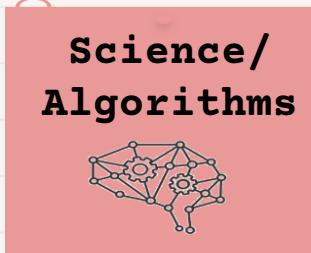


Feedbacks

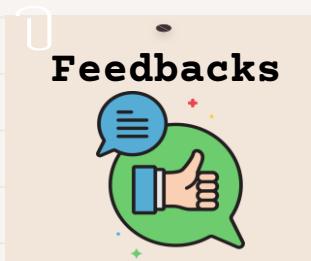
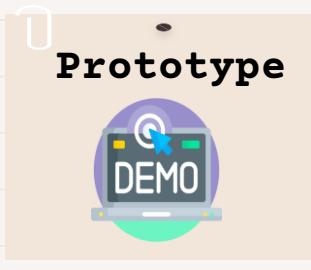
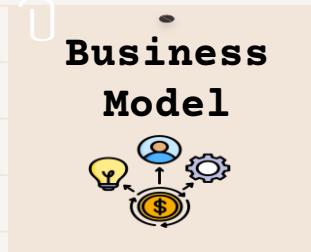
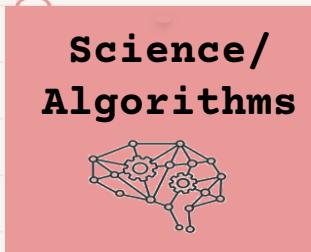


Paper

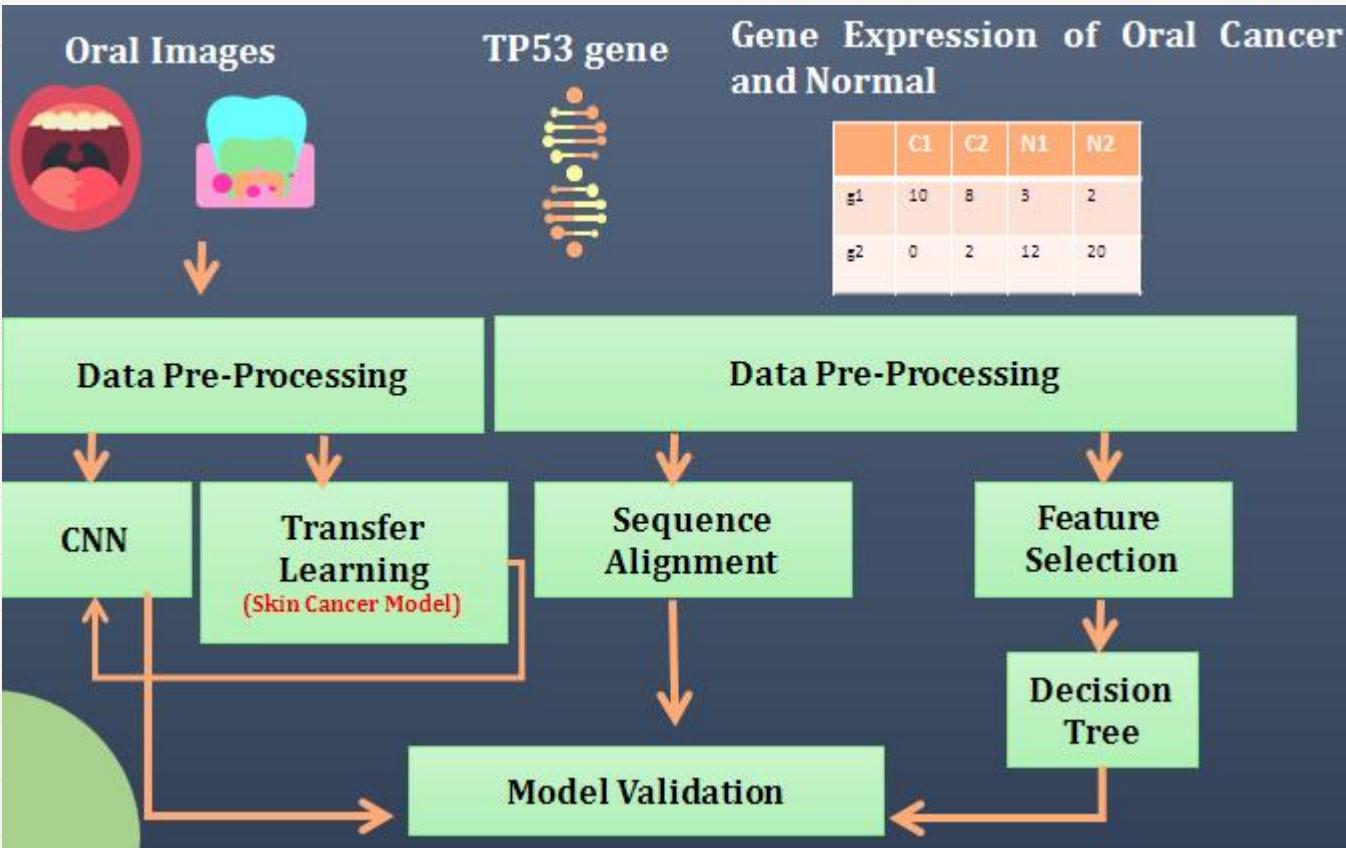




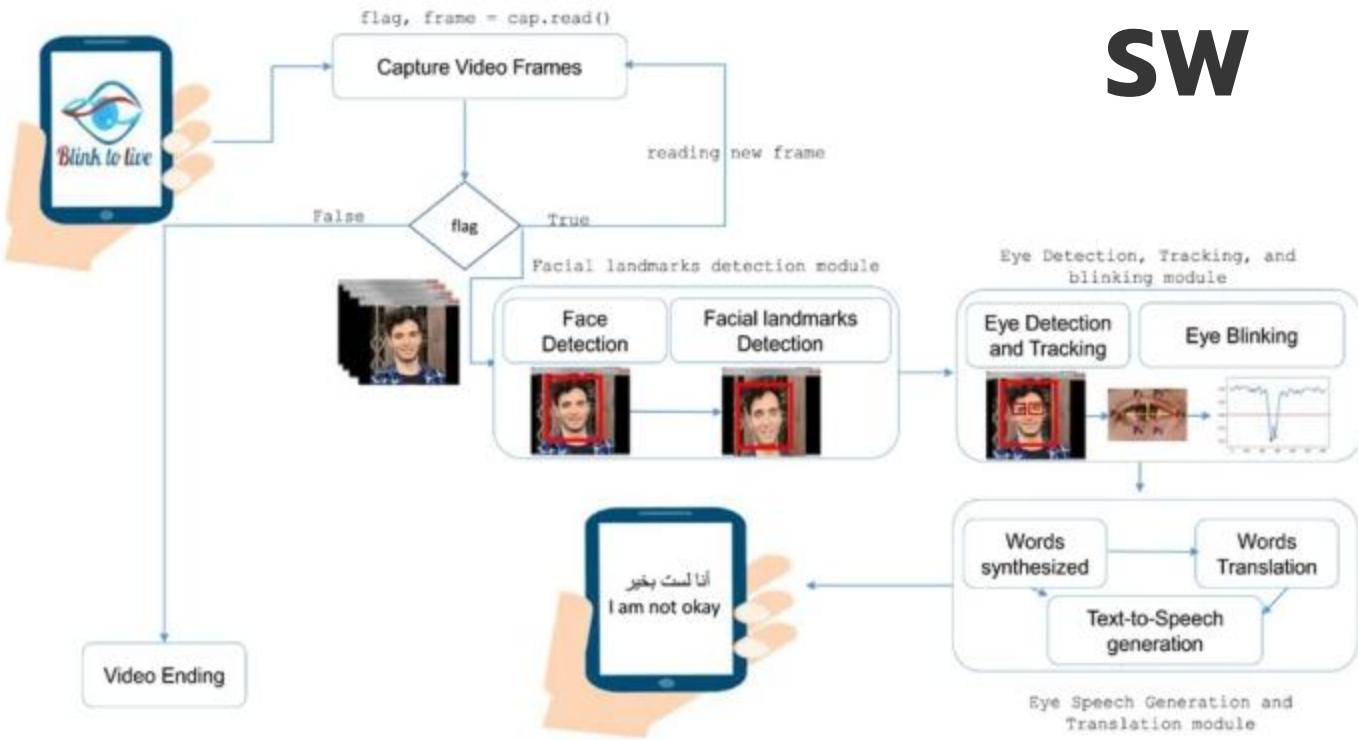
- Methodology (How)
- System Architecture (Inputs, Processing, Outputs)
- Modularize your System
- Flowcharts
- References



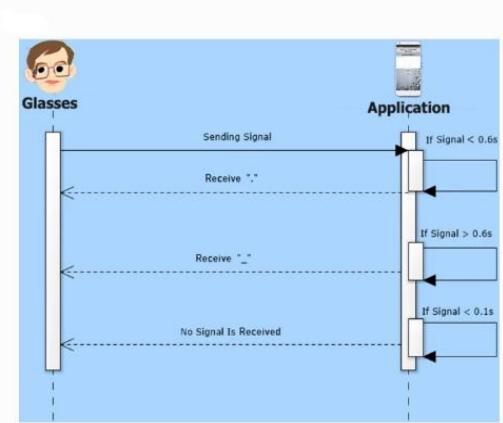
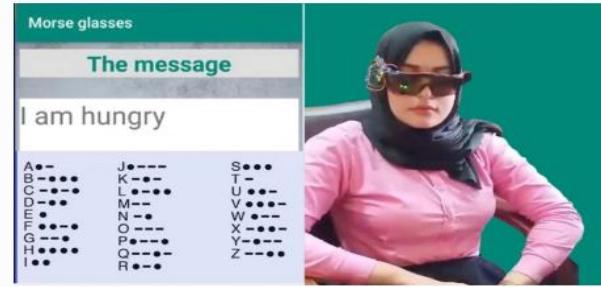
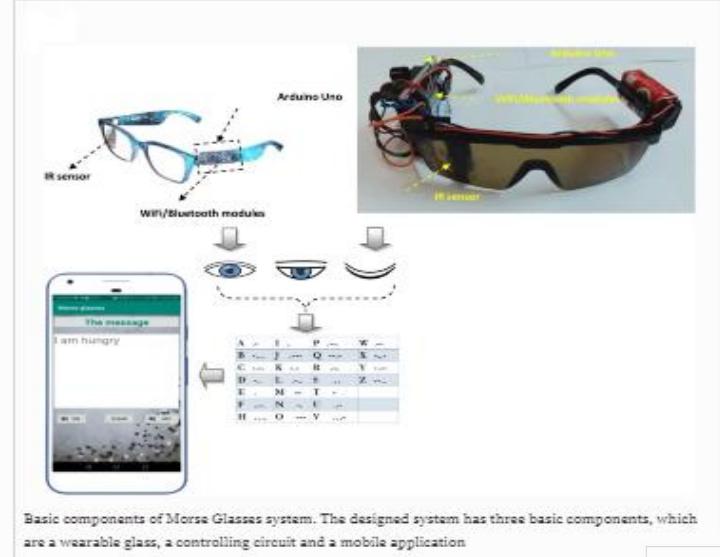
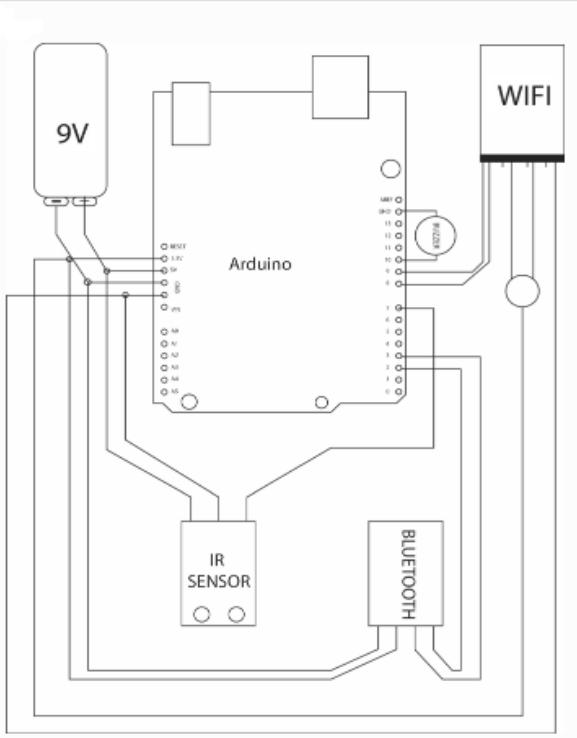
- ✓ You are a computer scientist
- ✓ Find an expert in the project scope (**might be a student from another faculty**)
- ✓ Thinking out of the box always Lead to a research paper.
- ✓ Study other scientific solutions
- ✓ Do not re-invent the wheel (code reusing and acknowledgment)
- ✓ Ask for help (Scientific Communities)
- ✓ Keep in mind: a research paper is your final goal.



SW



Blink-To-live Communication System Architecture.



HW

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

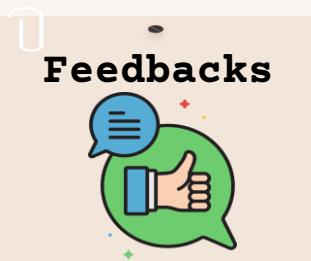
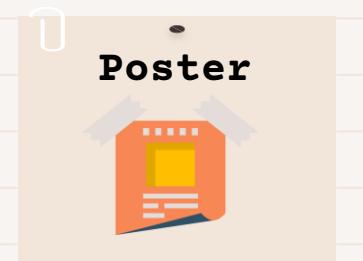
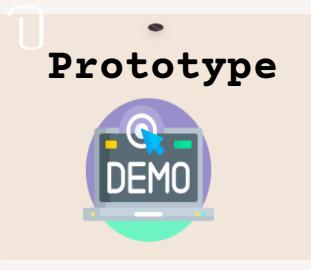
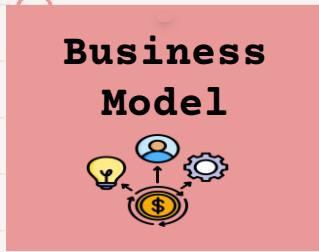
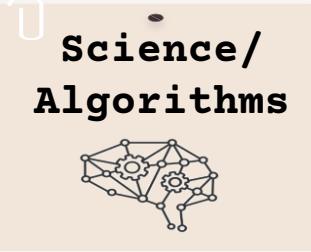


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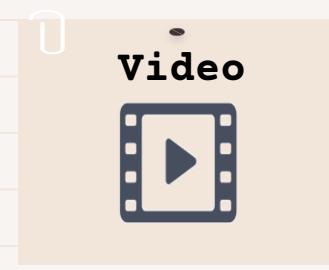
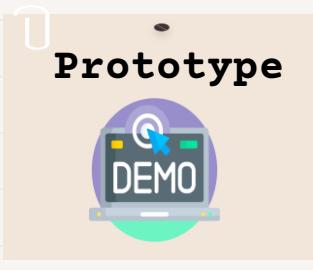
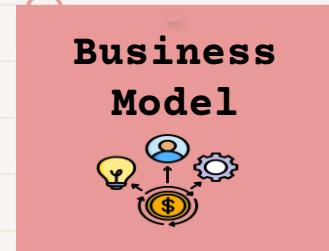
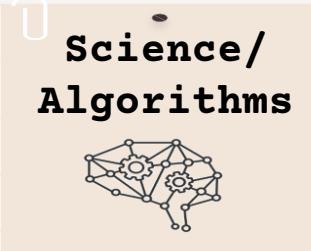


Paper

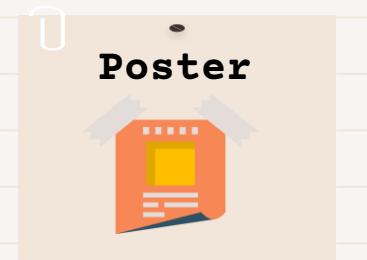


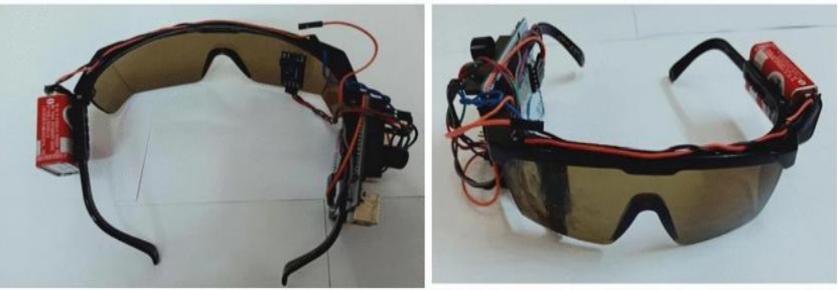


- Purpose of your Business (Scope/ Problem Definition)
- Customers and Value Propositions
- Channels and Customer Relationships
- Key Resources, Key Activities and Key Partners
- Cost Structure and Revenue Streams
- Key Metrics (KPIs)
- Linking The Boxes +Tidying Up
- Telling The Story
- Assumptions Testing



- ✓ Ask Experts
- ✓ Utilize University Supporting Centers (Creativa/ITIDA/ UDC)
- ✓ Ask Chatgpt





Key Partners	Manufacturers, Healthcare Organizations, Software Developers
Key Activities	Research and Development, Manufacturing, Marketing and Outreach, User Support
Key Resources	Intellectual Property, Manufacturing Facilities, Human Resources, IT Infrastructure
Value Propositions	Affordable Communication, Ease of Use, Accessibility
Customer Segments	Patients with Speech Impairments, Healthcare Institutions, Caregivers and Families
Channels	Online Marketing, Healthcare Partnerships, Word of Mouth
Customer Relationships	Customer Support, Feedback Loop
Revenue Streams	Device Sales, Subscription Model, Licensing:
Cost Structure	Materials and Manufacturing, Research and Development, Marketing and Promotion, Salaries and Benefits, Server and IT Costs, Support and Training.
Key Metrics	<ul style="list-style-type: none"> • Device Sales: Number of Morse Glasses devices sold. • User Adoption Rate: Percentage of users who successfully use the product. • Customer Satisfaction: Feedback and satisfaction ratings from users and healthcare providers. • Cost per Acquisition: Cost of acquiring each new customer. • Churn Rate: Rate of users discontinuing the service.

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster



Feedbacks



Paper



Proposal



Science/ Algorithms



Business Model



Budget



Prototype



Video



Poster



Feedbacks



Paper



- ✓ Start very early
- ✓ Decide your personal budget
- ✓ Study fund rules and apply for it
- ✓ Consider Transportation, Accommodation, Competition fees
- ✓ Negotiate with your Supervisor
- ✓ Get required Signature very early
- ✓ Pay first and then refund
- ✓ Keep bills and always consider taxes (evidences)



ITAC Graduation Project



The next step will be to refer to the Graduation Projects Financial Guidelines and fill in the budget form and send it to: gbudget@itida.gov.eg. Please note that the budget form must be sent via the Project Supervisor e-mail in order to be accepted. The deadline for sending the budget forms is Tuesday 29th March 2022.

٢ التسوية وصرف الدعم

- الأستاذ المشرف على المشروع مسؤول مسئولية كاملة عن صرف مبلغ الدعم في احتياجات المشروع فقط.
- يصرف الدعم بعد تقديم فواتير الشراء، ووفقاً للمبلغ المخصص لكل بند بالميزانية المعتمدة يتحول بنكي على حساب الأستاذ المشرف على المشروع - (ملاحظة: لا توجد دفعة مقدمة)
- يتم تسوية الفواتير جملة واحدة أو بحد أقصى على مرحنتين (خلال شهرى ابريل وسبتمبر)
- عند تقديم الفواتير، يجب تقديم خطاب رسمي من الكلية بالمشتريات غير المستهلكة التي تم تسليمها إلى مخازن أو ومعامل الكلية ليتم استخدامها في مشروعات التخرج للمسنوات القادمة.
- يقبل فقط أصول الفواتير الضريبية المختومة ومستخرجة باسم الكلية وموقعة من الأستاذ المشرف على المشروع.
- تعتمد المشتريات عبر الانترنت في حالة تقديم خطاب من الأستاذ المشرف على المشروع بغير عدم توفر المنتج محلياً مفضلاً تقديم فاتورة الشراء بصورة من كشف حساب بطاقة الائتمان المستخدمة.
- للهيئة حق رفض أية فواتير مقدمة على غير القواعد المذكورة أعلاه.
- يرجى توجيه أي استفسارات على العنوان الإلكتروني: gbudget@itida.gov.eg

القواعد المالية لدعم مشروعات التخرج

١ بنود الدعم

- يسمح بصرف مخصصات الميزانية على أي من البنود الآتية:
 - الأجهزة والأدوات والبرمجيات ذات الصلة بالمشروع.
 - الكتب المتعلقة مباشرةً بموضوع المشروع بحد أقصى ١٠٪ من إجمالي الميزانية المعتمدة من الهيئة (يرفق كشف بأسماء الكتب)
 - لا يسمح بصرف مخصصات الميزانية على البنود الآتية: المكافآت والحاسب الآلي والطابعات والماسح ضوئي والأجهزة والبرامج شائعة الاستخدام والأدوات المكتبية والدورات التدريبية.
 - يتبعن على الطلاب استخدام الأجهزة التي تم شراؤها عن طريق دعم البرنامج في مشروعات سابقة وتم إيداعها بمخازن الكلية.



ITAC Graduation Project

السعر الإجمالي بالجنيه المصري	سعر الوحدة بالجنيه المصري	العدد	البند	النوع (Software/ Hardware)
الإجمالي				

يوافق المشرف على ما يلي:

- الشروط والقواعد المذكورة في القواعد المالية لبرنامج دعم مشروعات التخرج.
- المشروع أعلاه هو ذات المشروع الذي قدم للتحكيم.
- سيتم مراجعة الميزانية المطلوبة وإن يتم دعم سوى البنود الموافق عليها وفقاً للقواعد المالية ل البرنامج.

التواقيع:



نموذج ميزانية مشروع تخرج

رقم المشروع:

اسم المشروع:

اسم الجامعة:

اسم الكلية:

اسم المشرف رباعي (كما هو وارد بالبطاقة):

رقم تليفون المشرف:

البريد الإلكتروني الخاص بالمشرف:

رقم بطاقة الرقم القومي (14 رقم):

رقم الحساب البنكي:

اسم البنك:

فرع البنك:



ITAC Graduation Project



Sara El-Metwally <sarah_almetwally4@mans.edu.eg>

to ITAC, mrahmawy@mans.edu.eg, graduation@mmabas77.com, mohamed.02.badr@gmail.com, abdokh950@gmail.com, mahmoudramadan496@gmail.cc

Mar 30, 2022, 12:33AM



Dear ITAC,

Thank you very much for supporting our project.

kindly, find the attached:

- 1- The requested budget form signed by me as a project supervisor.
- 2- The online purchasing statement of (VPS L NVMe) along with the bank verification message : the transaction initiated by my student and one of the team member: **Abdullah Mohamed Elsayed Mohamed Elkasaby**.
- 3- The online purchasing statement of some books: the transaction initiated by my student and one of the team member: **Abdelrahman Khaled**.

Please Let me know if any further information is required.

Thanks again for your funding and Support.

Sara

4 Attachments · Scanned by Gmail ⓘ





ITAC Graduation Project



السعر الإجمالي بالجنيه المصري	سعر الوحدة بالجنيه المصري	العدد	البند	النوع (Software/Hardware)
\$239.88 for 12 months 4538.66 جنيه	\$19.99	1	VPS L NVMe	Cloud Infrastructure
920 جنيه	240 EGP 180 EGP 240 EGP 260 EGP	4	Books	Books
5458.66 جنيه			الإجمالي	

يوافق المشرف على ما يلى:

الشروط والقواعد المذكورة في القواعد المالية لبرنامج دعم مشروعات التخرج.

-

المشروع أعلاه هو ذات المشروع الذي قدم للتحكيم.

-

سيتم مراجعة الميزانية المطلوبة وإن يتم دعم سوى البند الموافق عليها وفقاً للقواعد المالية للبرنامج.

-

التلو:



فتح باب التقدم لبرنامج "مشروعى بدايتنى" لدعم مشروعات التخرج للعام资料 2023/2022

أعلنت أكاديمية البحث العلمي والتكنولوجيا عن فتح باب التقدم لبرنامج "مشروعى بدايتنى" لدعم مشروعات التخرج للعام الدراسي 2023/2022، وذلك خلال الفترة من 01/11/2022 وحتى 31/12/2022.

الجدير بالذكر أن البرنامج هذا العام يقدم الدعم للمشروعات الفردية للطلاب، والمشروعات المجمعة والخاصة فقط بالهيئات والجامعات في عدة مجالات وهي العلوم الهندسية، علوم الحاسوب، العلوم الأساسية، الدراسات المستقبلية، العلوم البيئية والمترافقية، العلوم التطبيقية، الأجهزة الطبية التعويضية، الصناعات النسجية، الروبوتات، علوم الفضاء، والتكنولوجيا الحيوية.

للمزيد من التفاصيل:

[/http://www.osrt.sci.eg/open-calls/mp-ms](http://www.osrt.sci.eg/open-calls/mp-ms)

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

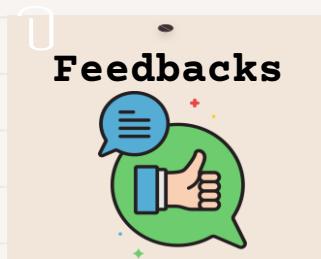
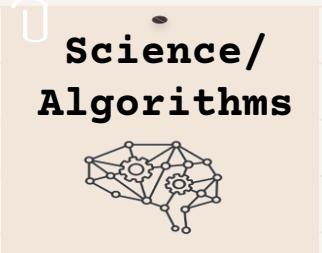


Feedbacks



Paper





- ✓ Start very early.
- ✓ Agile Project Management
- ✓ Prioritize your Tasks
- ✓ Develop Packages/ APIs , Mobile, Web sites, Desktop Apps.
- ✓ Real Life Demo Not UI.
- ✓ Make it easy for testing .
(Notebooks, Testing data, Printing images on cards etc.)
- ✓ Results Reproducibility.
- ✓ Judge Engagement and Interactivity.
- ✓ Add some fun and excitement.



Blink-To-Live

Public

Unwatch 2

Fork 0

Star 3

master ▾

1 branch 0 tags

Go to file

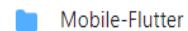
Add file ▾

Code ▾



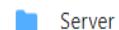
SaraEl-Metwally Update README.md

acbe80a on Nov 27, 2022 48 commits



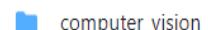
Mobile-Flutter first commit

last year



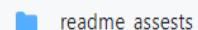
Server first commit

last year



computer_vision upload

9 months ago



readme_assets Add files via upload

last year



.gitattributes Add design file

9 months ago



README.md Update README.md

9 months ago

About

Our Graduation project for FCIS
mansoura university - CS depart

Readme

Activity

3 stars

2 watching

0 forks

Report repository

Made with Python3



Blink To Live

Computer vision based mobile application for Patients with speech and verbal motor disorders .

[About The Project](#) • [Requirements](#) • [How To Use](#) • [Demo](#) • [References](#) •

About The Project

Patients with speech and verbal motor disorders have difficulties to communicate with their living world. They gradually lose the ability to control their muscles leading to a completely paralysis stage where their eye's pupil is the only available movement organ for initiating a communication with the others.

Blink-To-Live is a computer vision based mobile application for tracking the eight eye states defined in the [Blink-To-Speak](#) book which is a communication language based on eyes blinks and translates it to a sequence of communicated sentences based on the pre-defined eye's blinks alphabets called Blink to Speak.

The camera will be used to track the patient's eyes and the computer vision module will be used to decode the eyes movements/blinks and translated it to the corresponding communicated sentences.

the patient can learn the eye's alphabets via our application in the fast and efficient manner.

Project Dependencies

```
pip install fastapi
```

```
pip install opencv-python
```

```
pip install numpy
```

```
pip install dlib
```

How to use

Desktop version

1. Install Project Dependencies
2. Clone the [GitHub repo](#), e.g. with `git clone https://github.com/zw01f/Blink-To-Live.git`
3. Run python CV-Model-final.py

Mobile Application version

Run the [Flutter](#) project on your real device, signup with your phone, Facebook, gmail or whatever you want, and then it to learn a language or if you want to understand the patient directly by opening the camera from the Patient screen and noticing the patient's face. The app will then show what the patient intends to

References

1. Sane, H. [Blink-To-Speak](#).
2. [Dlib C++ Library for Real-Time Face Pose Estimation](#).
3. [Translate python library](#).
4. [Text to Speech Service by Microsoft Azure](#).
5. [FastAPI](#).

```
In [1]:  
import numpy as np  
import pandas as pd  
import io  
import requests  
import matplotlib.pyplot as plt
```

```
In [2]:  
url="http://covidtracking.com/api/states/daily.csv"  
s=requests.get(url).content
```

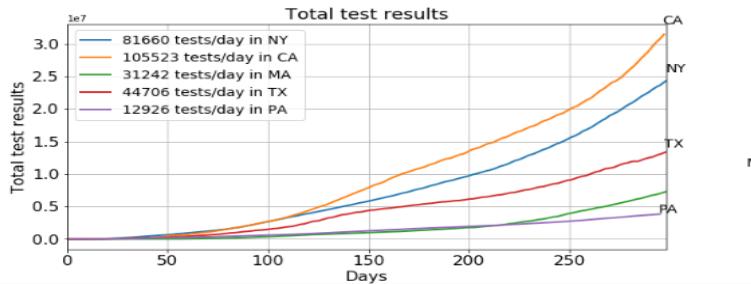
```
In [3]:  
df = pd.read_csv(io.StringIO(s.decode('utf-8')))
```

```
/Users/sarael-metwally/opt/anaconda3/lib/python3.7/site-packages/IPython/core/interactiveshell.py:3063: DtypeWarning: Columns (15) have mixed types.Specify dtype option on import or set low_memory=False.  
    interactivity=interactivity, compiler=compiler, result=result)
```

```
In [4]:  
df.head(5)
```

```
Out[4]:  
      date state  positive  probableCases  negative  pending  totalTestResultsSource  totalTestResults  hospitalizedCurrently  hosp  
0  2020-12-26    AK     43990.0           NaN  1201073.0    NaN  totalTestsViral        1245063.0          79.0  
1  2020-12-26    AL     343458.0        64801.0  1560978.0    NaN  totalTestsPeopleViral       1839635.0         2470.0  
2  2020-12-26    AR     213969.0        34329.0  1827152.0    NaN  totalTestsViral        2006792.0         1059.0  
3  2020-12-26    AS      0.0             NaN   2140.0    NaN  totalTestsViral         2140.0          NaN  
4  2020-12-26    AZ     493041.0        22567.0  2293262.0    NaN  totalTestsViral        4893296.0         4165.0
```

5 rows × 55 columns



Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster



Feedbacks



Paper



Proposal



Science/ Algorithms



Business Model



Budget



Prototype



Video



Poster



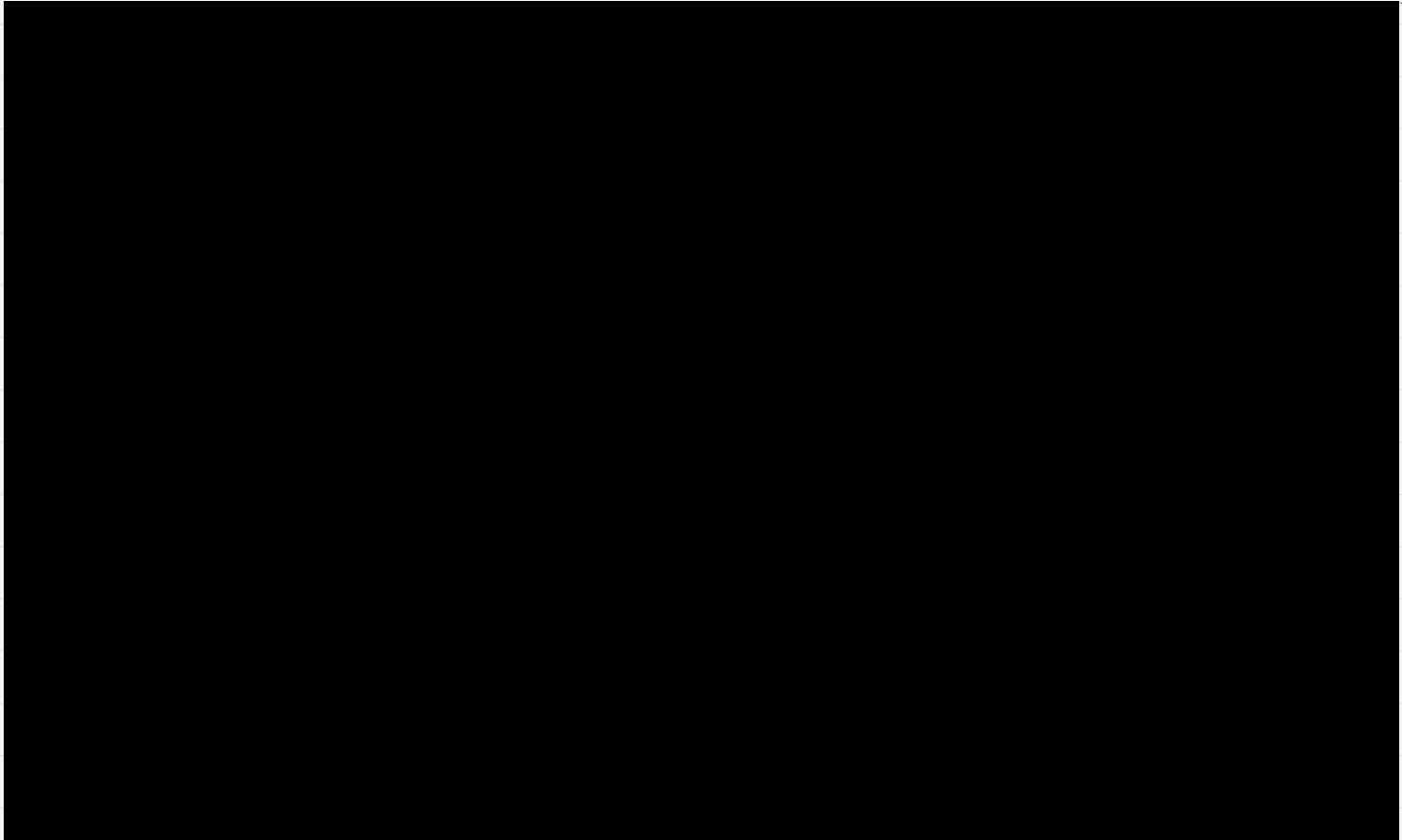
Feedbacks



Paper



- ✓ Story Telling
- ✓ Preparing a Scenario
- ✓ Start from simple non technical story to the complex scientific one
- ✓ Videos for Project Explanations
- ✓ Videos for Project Explanations and Implementations.
- ✓ Starting point for winning a competition.
- ✓ Follow competition rules (Video within 5 minutes)
- ✓ Clear and attractive voice over with different tunes in different parts of the story telling process.
- ✓ Use AI tools to generate sounds, videos, images, graphics, etc.
- ✓ Hire someone if you will not able to make it and add this cost in the budget.







Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

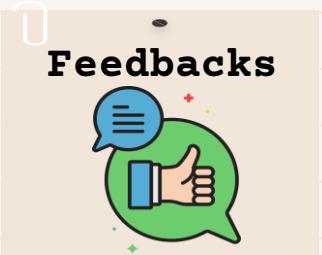
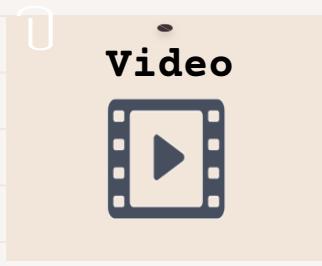
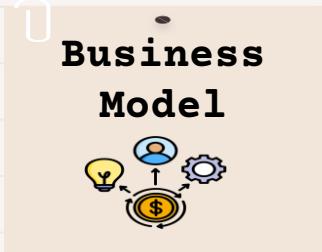
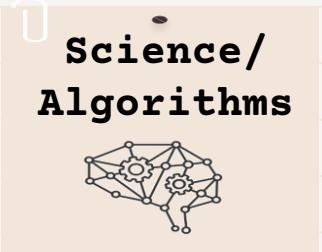


Feedbacks



Paper





- ✓ If the Competition Scope Research, follow scientific rules standards.
- ✓ If the Competition Scope Design, try your best to design a poster that reflects your project.
- ✓ Read Competition Rules Carefully
- ✓ Use free templates
- ✓ See other students work (FCI page)
- ✓ Hire a designer, and add this cost in the budget.

LightAssembler: fast and memory-efficient assembly algorithm for high-throughput sequencing reads

Sara El-Metwally^{1,2}, Magdi Zakaria², Taher Hamza²¹Molecular and Computational Biology, University of Southern California, Los Angeles, CA 90089, USA.,²Computer Science Department, Faculty of Computers and Information, Mansoura University, Mansoura 35516, Egypt.

Abstract

LightAssembler is a lightweight assembly algorithm designed to be executed on a desktop machine. It uses a pair of cache oblivious Bloom filters, one holding a uniform sample of g-spaced sequenced k-mers and the other holding k-mers classified as likely correct, using a simple statistical test. LightAssembler contains a light implementation of the graph traversal and simplification modules that achieves comparable assembly accuracy and contiguity to other competing tools. Our method reduces the memory usage by 50% compared to the resource-efficient assemblers using benchmark datasets from GAGE and Assemblathon projects. While LightAssembler can be considered as a gap-based sequence assembler, different gap sizes result in an almost constant assembly size and genome coverage. The software is open-source and user-friendly, free to download and easy to install and use.

Introduction

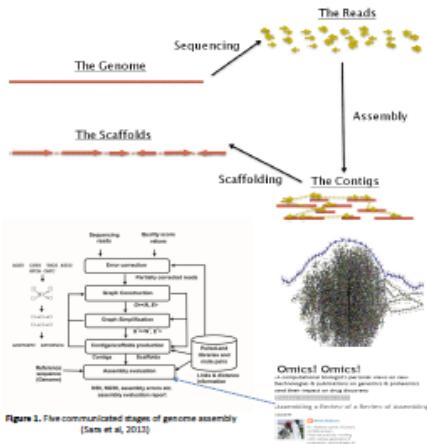


Figure 1. Five communicated stages of genome assembly (Sam et al., 2013)

Methods and Materials

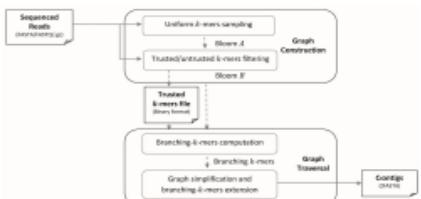


Figure 2. LightAssembler framework (Sara et al., 2016)

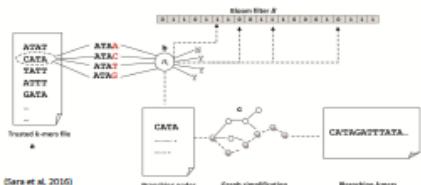


Figure 3. LightAssembler graph traversal module (Sara et al., 2016)

Results

Table 1. Resource requirements (peak resident memory and running time) for real datasets.

Assembler	Memory (GB)	Time (min)						
Velvet	2.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00
Aleph	2.00	30.00	4.00	5.73	30.00	16.27	30.00	16.27
SALSA	2.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00
Minimus	2.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00
Spades	2.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00
LightAssembler	2.00	30.00	2.00	30.00	2.00	30.00	2.00	30.00

Table 2. Contig statistics for the GAGE human chromosome 14 dataset (size 88289540 bp)

Assembler	contig	mean	max	min	95%ile	99.99%	count	coverage (%)
Velvet	43257	40843	65242	2022	4154	1024	10	10.00
Aleph	14000	10000	10000	10000	10000	10000	10000	100.00
SALSA	70000	47447	47447	1023	5064	5064	96424	99.42
Minimus	20000	16000	16000	1023	16000	16000	10000	100.00
Spades	22000	16000	16000	1023	16000	16000	10000	100.00
LightAssembler	10000	8000	10000	1023	8000	8000	10000	100.00

Table 3. Contig statistics for Assemblathon 2 bird dataset (estimated genome size 1.23 Gbp).

Assembler	contig	mean	max	min	95%ile	99.99%	count	coverage (%)
Velvet	662400	334400	1000000	1000000	1000000	1000000	1000000	10.00
Aleph	662400	334400	1000000	1000000	1000000	1000000	1000000	100.00
SALSA	1874000	183470	1700000	1000000	183470	183470	183470	99.97
Minimus	1731000	163100	163100	1023	163100	163100	163100	99.95
Spades	1731000	163100	163100	1023	163100	163100	163100	99.95
LightAssembler	100000	80000	100000	1023	80000	80000	100000	100.00

Table 4. Scaffold statistics for GAGE human chromosome 14 dataset.

Assembler	scaffold	mean	max	min	95%ile	99.99%	count	coverage (%)
Velvet	40457	35112	50000	1023	50000	50000	40	10.00
Aleph	40457	35112	50000	1023	50000	50000	40	10.00
SALSA	48871	287100	380000	1023	287100	287100	40	10.00
Minimus	211685	204770	318884	1023	204770	204770	27	10.00
Spades	41544	254848	312000	1023	254848	254848	26	10.00
LightAssembler	10000	8000	10000	1023	8000	8000	10000	100.00

Table 5. Accuracy of LightAssembler k-mers classification for real datasets.

Assembler	contig	mean	max	min	95%ile	99.99%	count	accuracy (%)
Velvet	40457	35112	50000	1023	50000	50000	40	100.00
Aleph	40457	35112	50000	1023	50000	50000	40	100.00
SALSA	48871	287100	380000	1023	287100	287100	40	100.00
Minimus	211685	204770	318884	1023	204770	204770	27	100.00
Spades	41544	254848	312000	1023	254848	254848	26	100.00
LightAssembler	10000	8000	10000	1023	8000	8000	10000	100.00

Conclusions

- NGS machines have enriched our understanding of complex biological phenomena through a plethora of sequencing data at high speed and low sequencing cost.
- The assembly process can be viewed as a framework of five communicated stages that cooperate to assemble the deluge of short sequenced reads.
- LightAssembler is a lightweight assembly algorithm designed to overcome the limited computational resources available in the developing countries like Egypt.
- LightAssembler has a comparable accuracy and contiguity results to the current state-of-the-art assembly tools while reducing the memory usage to 50%.

LightAssembler

<https://github.com/SaraEl-Metwally/LightAssembler>

Comments

Contact
Sara El-Sayed El-Metwally, Ph.D.
Assistant Professor,
Computer Science Department,

References

1. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
2. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
3. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
4. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
5. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
6. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
7. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
8. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
9. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
10. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
11. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
12. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
13. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
14. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
15. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
16. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
17. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
18. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
19. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
20. El-Metwally S, Zakaria M, Hamza T. LightAssembler: a fast and memory-efficient assembly algorithm for high-throughput sequencing reads. *Plant Methods*. 2016;12:10.
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[MOTUS]

Restore Paralyzed Upper Limb Movement Using Brain Signals

Ahmed Elsaied - Amaal Ahmed - Amr Abd Elaty - Anas Ibrahim
Hager Shiref - Mohamed Amgad - Nada Abid - Samir Saad - Seif Aleslam Mohamed - Zeyad Tarek

Supervised by Prof. Taher Hamza - Dr. Mohamed Handosa.

Medical Informatics & Computer Science dept. Faculty of Computers and Information Science, Mansoura University, Egypt.



CS-02 CH-15

Abstract.

Doing essential and simple daily life activities is a hard challenge for paralyzed people especially those who have paralyzed upper limb due to cervical spinal cord injury.

So, patients resort to traditional physical therapy, which lasts for a long time. We will help those people with a portable, quick and lightweight solution by developing a wearable arm exoskeleton located above the patient's upper limb which moves depending on the patient's real-time brain signals after reading and decoding them and classifying arm movement.

And also track the progress of patient's improvements.

Background.

The **paralysis** will hinder the arm movement to do the daily activities. According to W.H.O, every year between **250,000** and **500,000** people suffer a spinal cord injury due to road traffic crashes, falls and violence as the three leading causes.

It has costly consequences for the individual and society. They also have lower rates of school enrollment and economic participation.

Recently, technology ensuring an adequate medical and rehabilitation response can help minimize the disruption to people with spinal cord injury and their families.

Objectives.



- Rehabilitate the paralyzed upper limb to restore movement gradually (non-invasive and with no implants).
- Activate the neural pathway between the upper limb and the brain.
- Decrease the period of traditional physical therapy.

System Architecture.



Results



Technologies.



Business Model.

BMC	Key Partners	Key Activities	Unique Value Proposition	Customer Segments
Product	Partnerships and collaborations with medical institutions and rehabilitation centers.	Developing the system to read and decode brain signals, activating the neural pathway, and controlling the exoskeleton.	Introducing a non-invasive and portable solution for paralyzed upper limb movement restoration.	Individuals with spinal cord injuries, especially those with cervical lesions, and their families.
Process	The system will be developed using machine learning and deep learning algorithms to analyze brain signals and control the exoskeleton.	Integrating the system with medical devices and sensors to provide real-time feedback and adjustments.	Offering a personalized and adaptive rehabilitation experience.	Healthcare professionals, including physiotherapists and medical doctors.
Outcome	The system will be deployed in clinical settings and rehabilitation centers.	Ensuring the system is safe and reliable for use in medical environments.	Providing a cost-effective alternative to traditional physical therapy.	Insurance companies and healthcare providers.
Resources	Human resources, including software developers, data scientists, and medical experts.	Collaborating with medical institutions and rehabilitation centers to validate the system's effectiveness.	Offering a unique service that combines medical expertise with advanced technology.	Individuals with spinal cord injuries, especially those with cervical lesions, and their families.

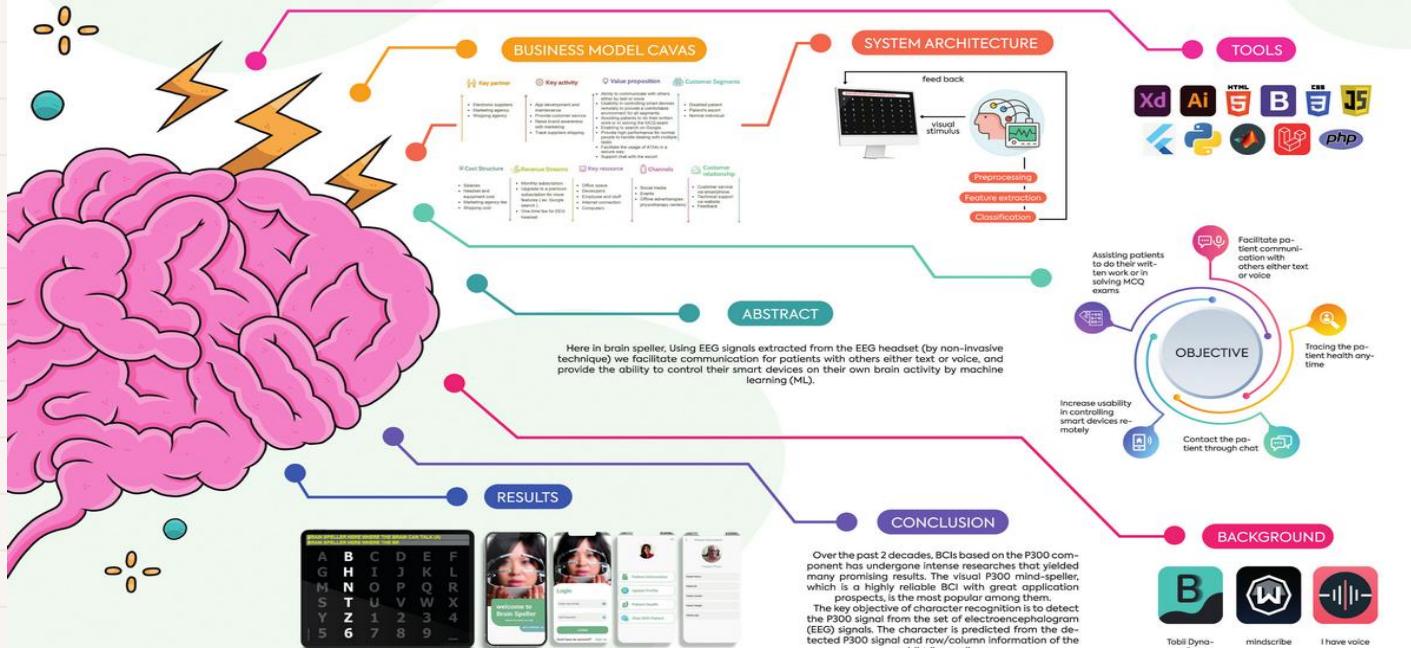
Conclusion.

The **exoskeleton** over the patient's affected upper limb moves in accordance with the patient's **brain signals**, which speeds up the **restoration** of movement and activates the neural pathway. Motus is an intelligent system that aims to assist physiotherapists in the rehabilitation of people with upper limb paralysis. In essence, we support physiotherapists in helping patients with upper limb paralysis gradually regain movement to resume daily activities!

BRAINSPELLER

P300 speller system based on BCI and ML CS-22 (CH-11)

Raneem Alashry ,Rana Al-Mansour , Manar Alaa ,Mohamed Abdelmonsef, Doaa Reyad ,
Merna Desouky ,Heba Samir , Rawan Gamal , Omar Islam , Roaa Osama , Farah Serag .





Fraps: A Face-Recognition-Based Payment System

Information Technology Department - Faculty of Computers and Information Systems, Mansoura University, Egypt. (IT10)

Team Members: Waleed Eldebsy, Weam Tarek, Mohammad Elgayar, Nour Hisham, Nada Atalla, Merehan Helmy,

Marwa Mohamed, Mohamed Atiah, Mohammed Maher

Under supervision of: Prof. Hassan Soliman



ABSTRACT

There is a growing interest in faster, safer, and more convenient payment methods.

Therefore, we are proposing a payment system based on facial-recognition technology that utilizes state-of-the-art deep learning algorithms.

To use the system, users must first register so that information about their faces is tied to a payment processor. The information can later be used to identify the registered user to confirm and complete his transactions.



BACKGROUND

Face recognition is one of the most natural, nonintrusive and low-cost biometric techniques.

In recent years, researchers have developed several techniques that utilized deep-learning to achieve near human performance for face detection and recognition.

Vulnerability to fraud is a reasonable concern in any payment system. That is why it is important to have face anti-spoofing techniques to protect sensitive data, reduce theft and mitigate fraud.



ARCHITECTURE



OBJECTIVES

- 1- Providing an alternative method of payment relying solely on people's faces, eliminating the need for cash, electronic cards and devices.
- 2- Addressing the complex issues regarding security and privacy in both traditional and modern payment systems.
- 3- Providing an API that enables developers and merchants to build applications that conform to many use cases.



CONCLUSION

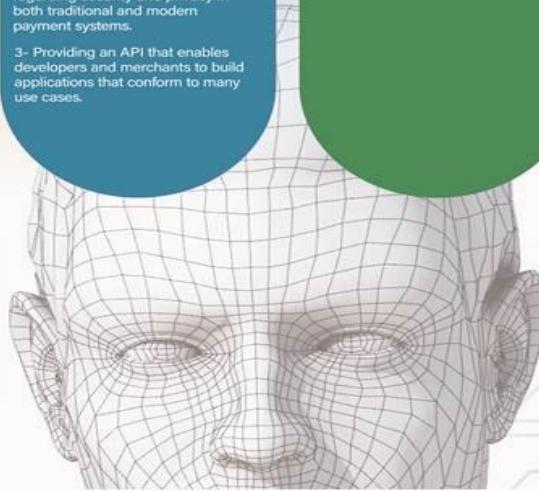
Our system provides a safer and more convenient method of payment. It reduces the risk of identity fraud and eliminates the need for carrying wallets or devices to fulfill your daily payment needs.



Tools Used

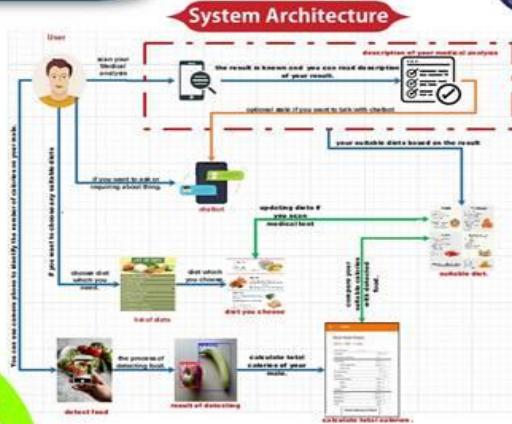


Business Model





INTELLIGENT HEALTH TRACKING SYSTEM BASED ON COMPUTER VISION



Team
Member

Ahmed Ali, Omnya Abd-Elmoaty, Kholoud Elsaied, Kholoud Amer, Amr Ragab, Hadeer Shawqy, Karam Mohammed, Mohammed Abd-Elhameed, Mahmoud El-Sayed, Mostafa El-Sayed.

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

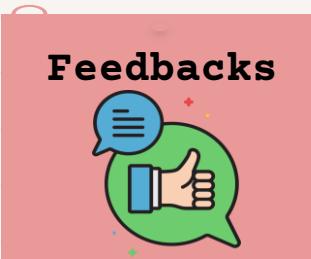
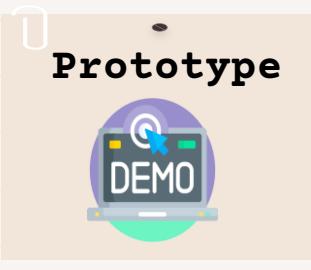
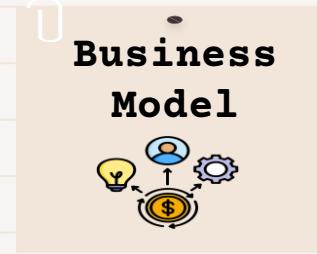
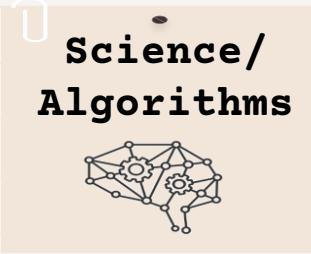


Feedbacks



Paper





- ✓ Document Customer Feedbacks.
- ✓ Record Videos.
- ✓ Take Photos as a Documentation.
- ✓ Take a snapshot from their feedbacks through forms or questionnaires.
- ✓ Add any feedbacks to a project video.

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster

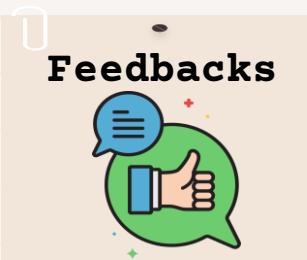
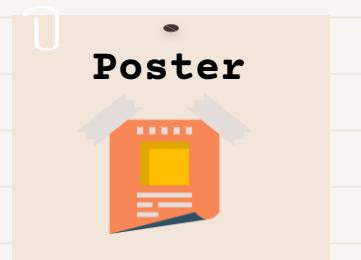
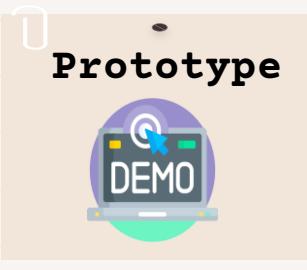
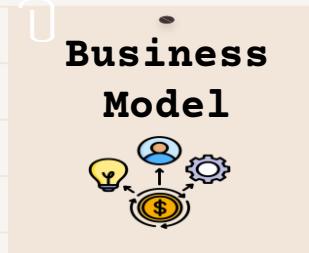
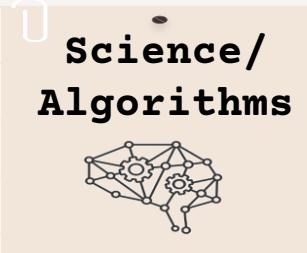


Feedbacks



Paper





- ✓ Research Competition always looking for a published paper or acknowledgment that you are submitting a research paper to a journal or conference.
- ✓ Do not forget to add publication fees to the budget or if you are managing to travel for presenting a research paper in a conference, include the transportation and accommodation.

Graduation Project

Proposal



Science/
Algorithms



Business
Model



Budget



Prototype



Video



Poster



Feedbacks

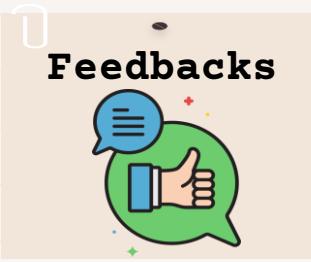
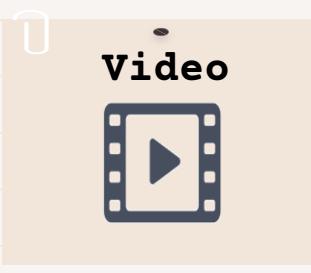
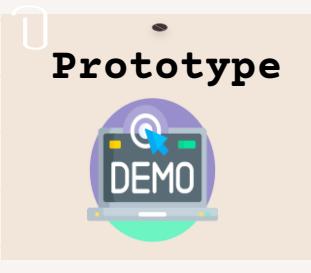
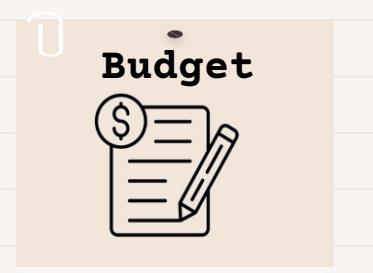
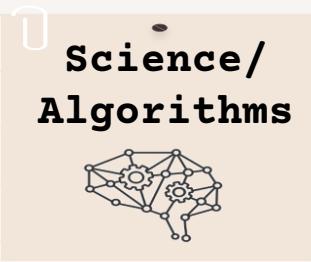


Paper

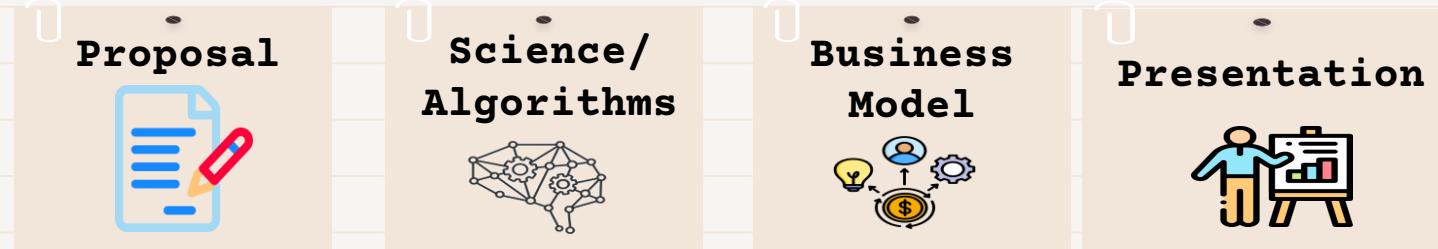


Presentation

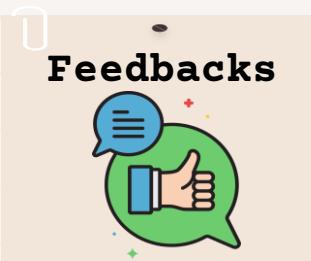
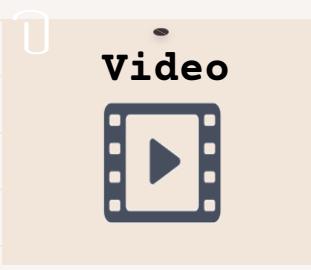
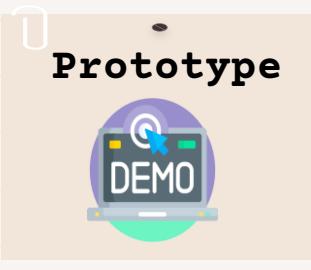
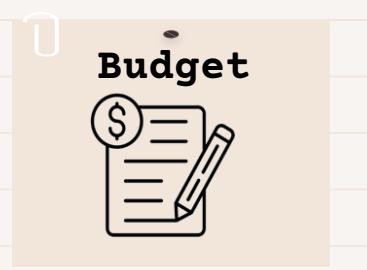
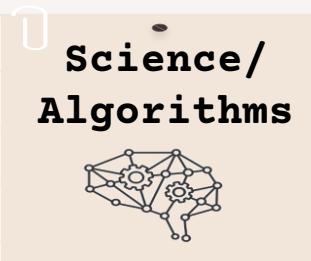




- ✓ Read Competition Rules Carefully (How many minutes are available, Scope, etc.)
- ✓ Use free templates and choose a design that reflects the project.
- ✓ Prepare a scenario
- ✓ Train, Train, Train
- ✓ Ask for feedbacks
- ✓ Communication Skills



Graduation Project



Simple, Reflects Project Idea, Use AI tools, follow Design Standards, Colors, etc.

Note!

Proposal



Science/
Algorithms



Business
Model



Presentation



Budget



Prototype



Video



Poster



Feedbacks

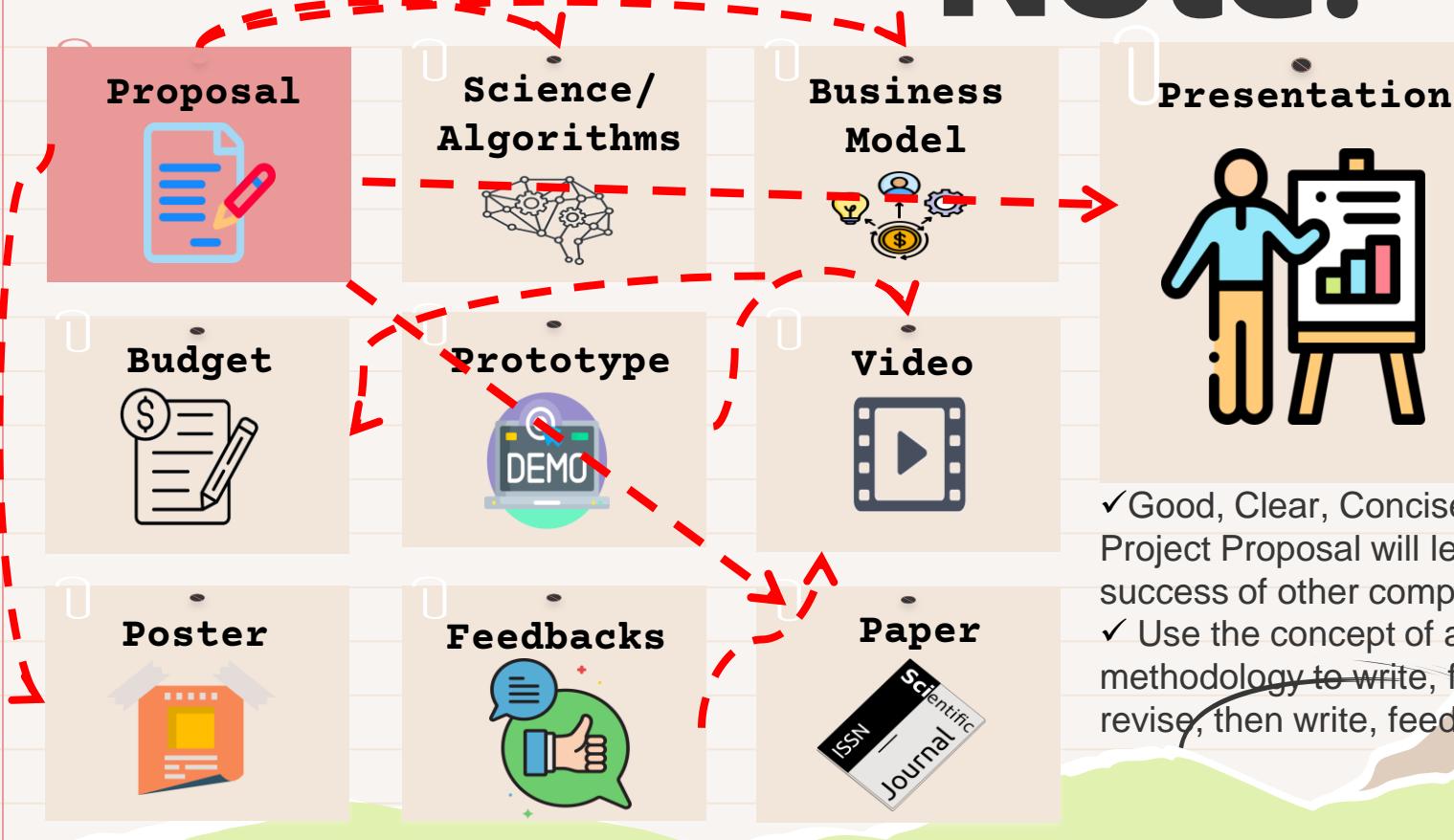


Paper



- ✓ Good, Clear, Concise, Specific Project Proposal will lead to the success of other components.
- ✓ Use the concept of agile methodology to write, feedback, revise, then write, feedback, refine,

Note!



- ✓ Good, Clear, Concise, Specific Project Proposal will lead to the success of other components.
- ✓ Use the concept of agile methodology to write, feedback, revise, then write, feedback, refine,

Conclusions

- ✓ Alone we can do so little; together we can do so much
- ✓ Talent wins games, but teamwork and intelligence win championships
- ✓ Simple Good Fully Implemented Idea with getting feedbacks from real customers and industrial segments is better than from complex new one.
- ✓ **Read Competition Rules**
- ✓ Know your judges (audience) very carefully, their background (Industry, Business, Academia) and adapt your speech, presentation, video, etc. accordingly.
- ✓ Know Competition Scope (Research, Business, Academic) and adjust different types of project components accordingly.
- ✓ Multi-disiplinary Team (students/supervisors)
- ✓ Most of competitions seeking for a real-life demo prototype so develop it very early, starting from a summer of third year.
- ✓ Decide from the beginning (Will you spend money in buying a hardware materials or not?)
- ✓ Prepare a personal team budget for (competitions fees, any emergency, etc.)
- ✓ Try simple local competitions for a training purpose and to get feedbacks ~~very early~~ المكتبة (المركزية - مسابقات النشاط العلمي على مستوى الجامعة- مسابقات تيمات مختلفة - مسابقات كريتيفا

Conclusions

- ✓ Always have a connection with your supervisors, most of competitions required their signatures, emails, bank accounts.
- ✓ Start a routine signing process with stamps very early: supervisor, faculty vice deans and deans.
- ✓ Do not ask for signing a project document from a faculty administrative members without your supervisor signature on every project proposal page.
- ✓ Collect information about teams that applied for the same competitions, start connections and communication, and arrange a transportation together (much more cheaper/ CIS as one of FCI teams, Faculty of Engineering, Do not forget to arrange the program of the day, the transportation through Cairo road through El-mahala so I can join the trip ☺)
- ✓ If you feel that the judge does not understand the point, it is never too late to clarify it.
- ✓ You need these skills in your team: presenter, computer scientist, business analyst, designer, system analyst beside that they all can work as developers (Technical Requirements).
- ✓ You need a person dedicated for managing competitions and their requirements.
- ✓ Some competitions have a limited number of participants (give the credits to the most influenced team members)

Conclusions

- ✓ Train, Train, Train, Train
- ✓ Ask for feedbacks (i.e. your friends, students, FCI members and Teaching Assistants)
- ✓ Ask for help (scientific communities on social media, faculty members, etc.)
- ✓ Learn from other teams experiences and stories.
- ✓ Do not be afraid to talk about your project.
- ✓ Publish, Publish, Publish
- ✓ Use Chatgpt for rephrasing and writing clear sentences and use other AI automated tools for writing scenarios, making templates, designs, videos, etc.
- ✓ a copy of your national ID card
- ✓ always keep any expenses bills
- ✓ always consider taxes
- ✓ always looking for training in Creativa hub, UDC (Engineering, Commerce, Main Center, Teams, etc)
- ✓ Have a clear overview of a project budget and update it continuously as well as project proposal .
- ✓ Local Conferences that published with IEEE are very easy to target
- ✓ The most influenced team member (scientist one) always be the first name on the paper.
- ✓ Some little attraction can help (T-shirts with a project logo, pins, brochure , etc.)



Graduation Project Team

Thanks!

Do you have any questions?
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