Як оформляти постер?

Підготовка

* По-перше, **ОЗНАЙОМТЕСЯ З ІНСТРУКЦІЯМИ**, які надають організатори зустрічі!
* Знаючи **всі деталі** перед початком роботи, вам буде легше успішно закінчити весь процес.
* Більшість з тих, хто прийде до постеру, хоче **не читати**, а скоріше **інспектувати** його.
* Тому ключем до створення ефективного постера є **візуальна простота**, що досягнута без втрати **інформаційного наповнення**

Основні вимоги

- Читабельність
- Чіткість
- Просторова організація
- Стислість
- Стиль

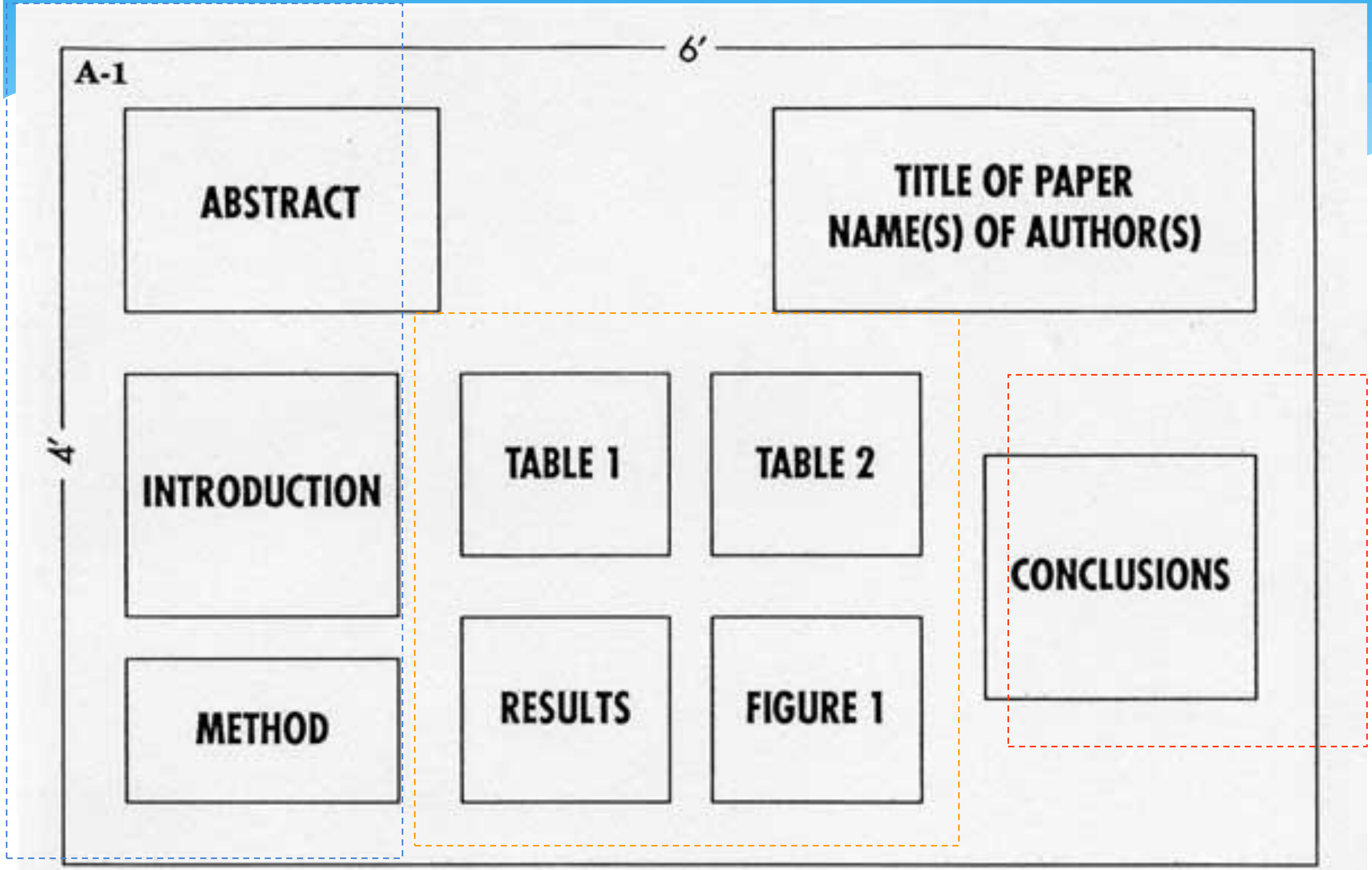
Наповнення

* Зробіть заголовок коротким і інформативним.
* Додайте короткий абстракт для орієнтації оглядача.
* Сплануйте історію, яку ви розкажете слухачу:
  * зміст: що, чому, як ?
  * результати і аналіз
  * важливість результатів
* Використовуйте “мову телеграм” і виділяйте основні положення
* Побудуйте прості графіки і таблиці
* Додайте візуальні матеріали для ілюстрації проекту і результатів
* Облегшіть слухачам можливість слідувати логіці інформації, що пояснює роботу

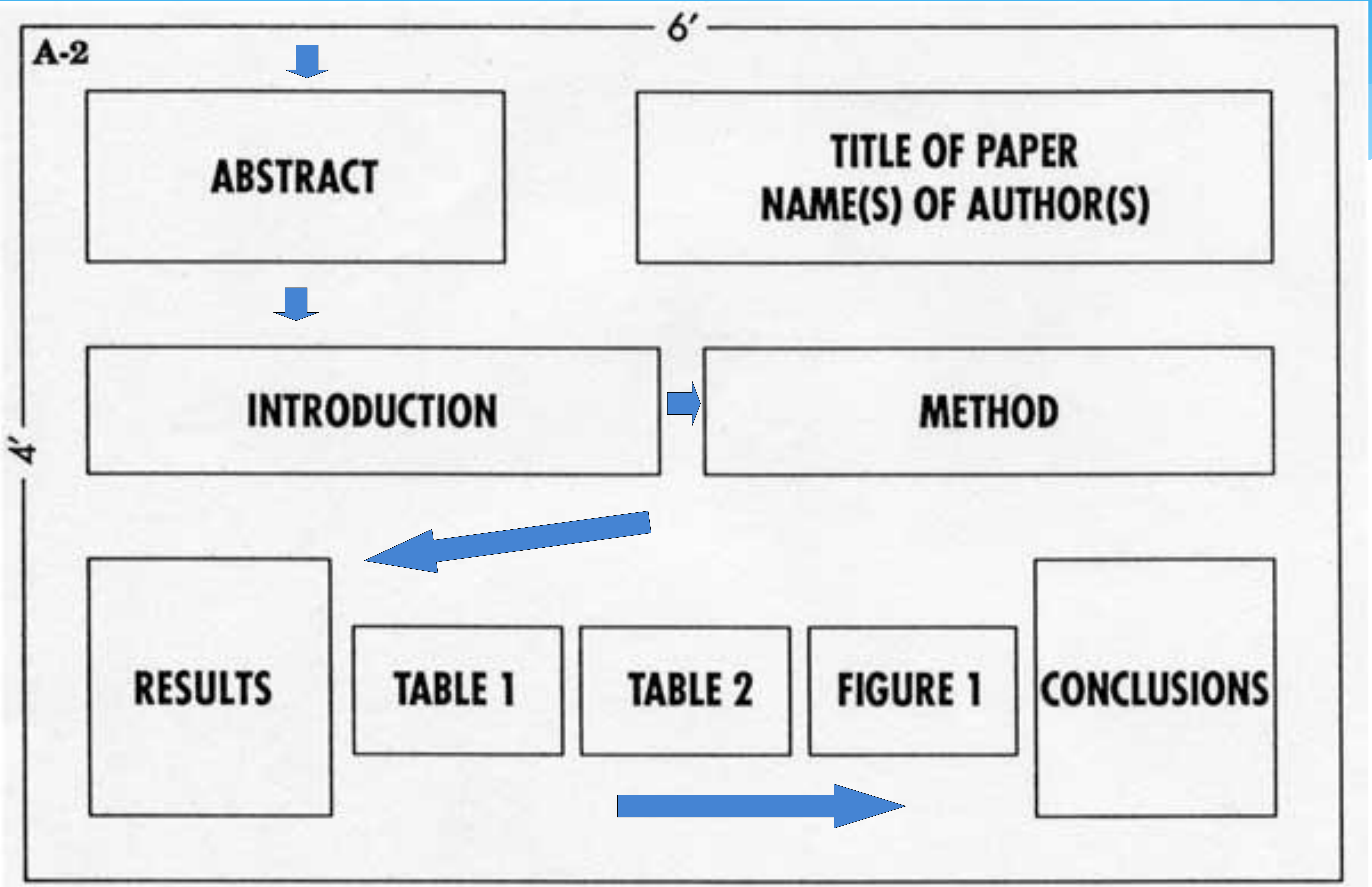
Структура

Мета Гіпотеза Матеріали та методи Хід роботи	Титулка Графіки Ілюстрації Дані та їх аналіз	Результати Висновки Абстракт Інша необхідна інформація

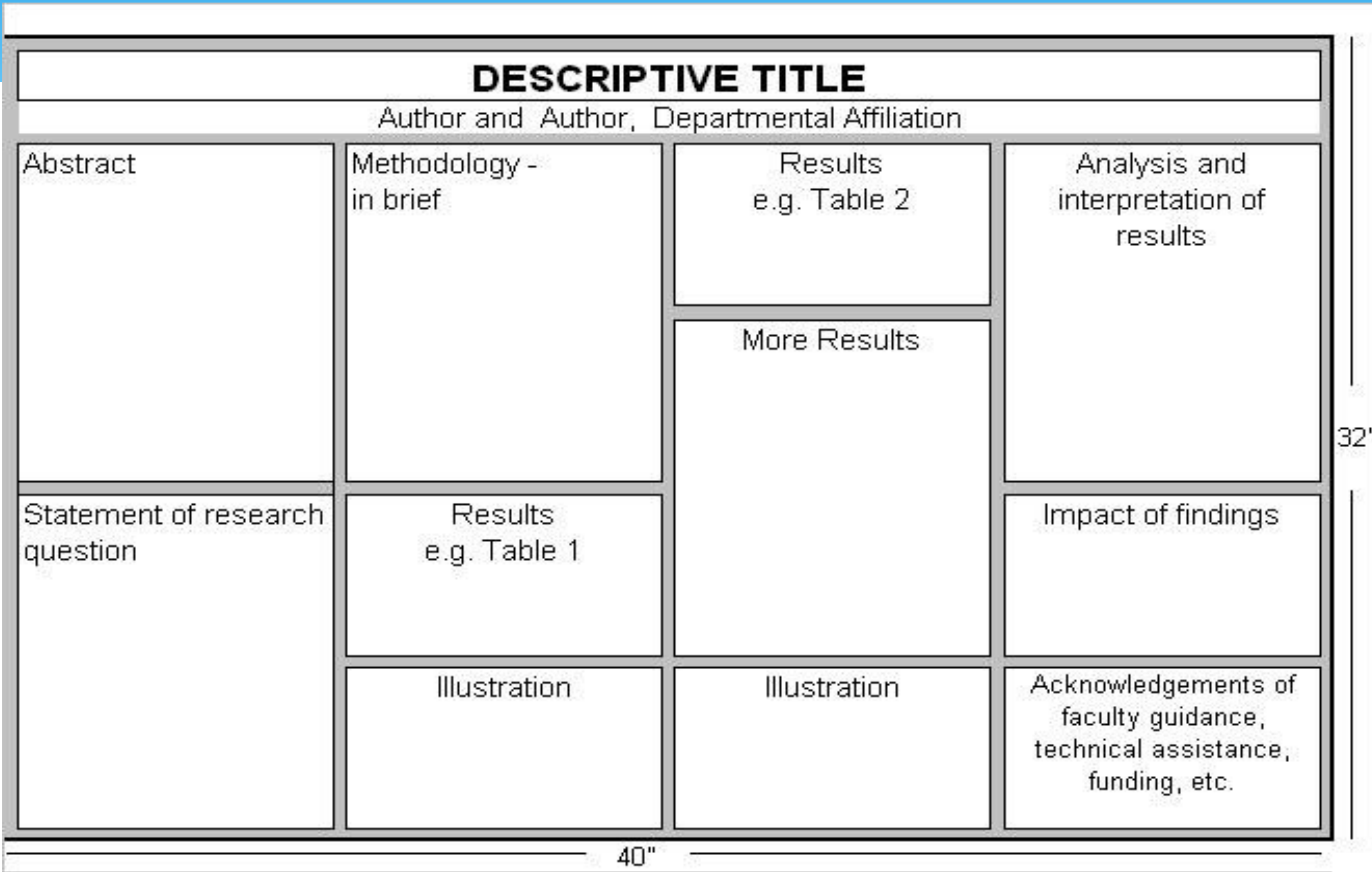
Кластерна схема

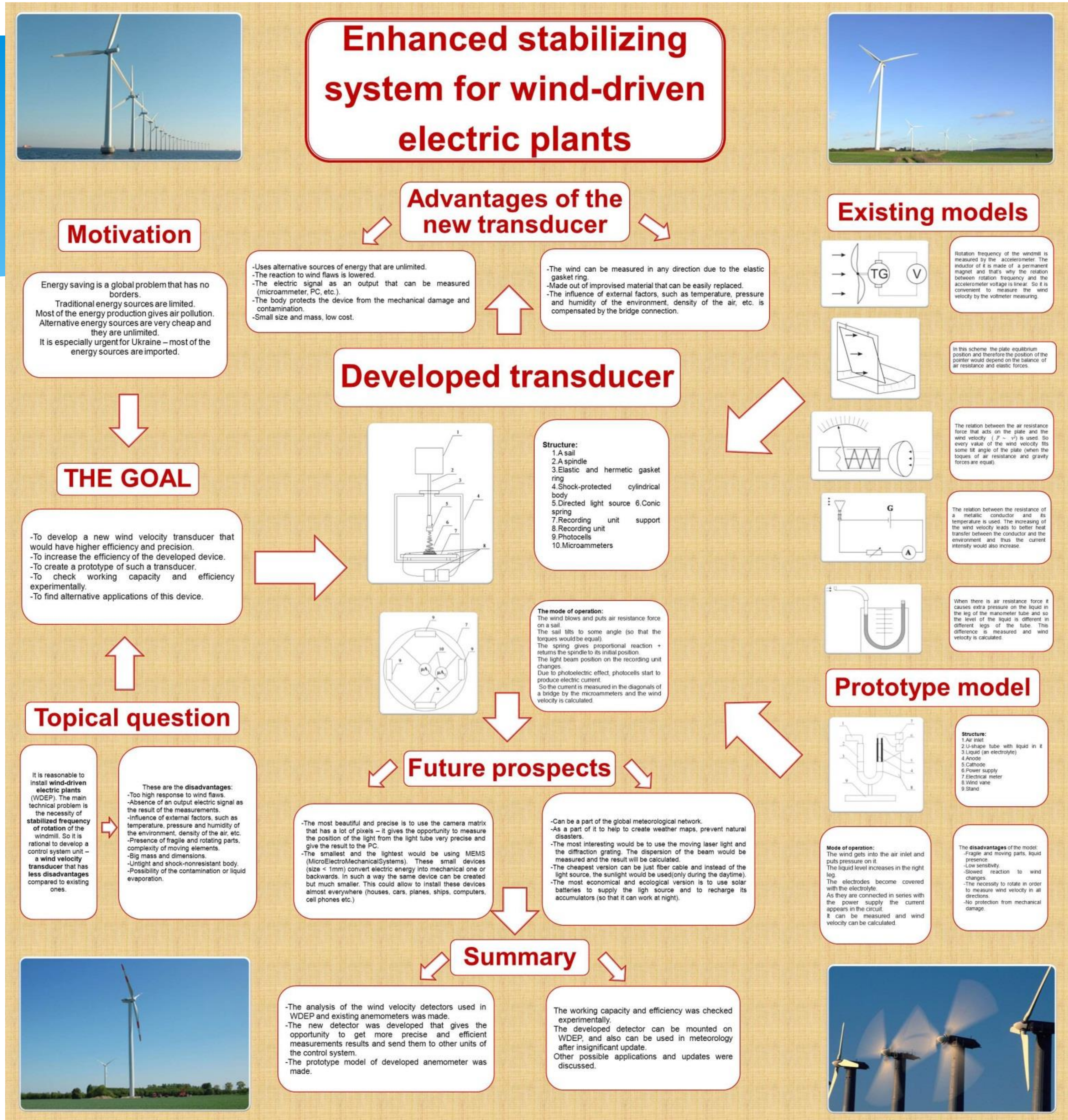


Логічна схема



Симетрична схема





Enhanced stabilizing system for wind-driven electric plants
Motivation
Energy saving is a global problem that has no borders.
Traditional energy sources are limited.
Most of the energy production gives air pollution.
Alternative energy sources are very cheap and they are unlimited.
It is especially urgent for Ukraine – most of the energy sources are imported.
THE GOAL
-To develop a new wind velocity transducer that would have higher efficiency and precision.
-To increase the efficiency of the developed device.
-To create a prototype of such a transducer.
-To check working capacity and efficiency experimentally.
-To find alternative applications of this device.
Topical question
It is reasonable to install wind-driven electric plants (WDEP). The main technical problem is the necessity of stabilized frequency of rotation of the windmill. So it is rational to develop a control system unit – a wind velocity transducer that has less disadvantages compared to existing ones.
These are the disadvantages:
-Too high response to wind flaws.
-Absence of an output electric signal as the result of the measurements.
-Influence of external factors, such as temperature, pressure and humidity of the environment, density of the air, etc.
-Presence of fragile and rotating parts, complexity of moving elements.
-Big mass and dimensions.
-Untight and shock-nonresistant body.
-Possibility of the contamination or liquid evaporation.
Advantages of the new transducer
-Uses alternative sources of energy that are unlimited.
-The reaction to wind flaws is lowered.
-The electric signal as an output that can be measured (microammeter, PC, etc.).
-The body protects the device from the mechanical damage and contamination.
-Small size and mass, low cost.
-The wind can be measured in any direction due to the elastic gasket ring.
-Made out of improvised material that can be easily replaced.
-The influence of external factors, such as temperature, pressure and humidity of the environment, density of the air, etc. is compensated by the bridge connection.
Developed transducer
Structure:
1.A sail
2.A spindle
3.Elastic and hermetic gasket ring
4.Shock-protected cylindrical body
5.Directed light source 6.Conic spring
7.Recording unit support
8.Recording unit
9.Photocells
10.Microammeters
The mode of operation:
The wind blows and puts air resistance force on a sail.
The sail tilts to some angle (so that the torques would be equal).
The spring gives proportional reaction + returns the spindle to its initial position.
The light beam position on the recording unit changes.
Due to photoelectric effect, photocells start to produce electric current.
So the current is measured in the diagonals of a bridge by the microammeters and the wind velocity is calculated.
Existing models
TG
V
Rotation frequency of the windmill is measured by the accelerometer. The inductor of it is made of a permanent magnet and that's why the relation between rotation frequency and the accelerometer voltage is linear. So it is convenient to measure the wind velocity by the voltmeter measuring.
In this scheme the plate equilibrium position and therefore the position of the pointer would depend on the balance of air resistance and elastic forces.
The relation between the air resistance force that acts on the plate and the wind velocity (F ~ v²) is used. So every value of the wind velocity fits some tilt angle of the plate (when the toques of air resistance and gravity forces are equal).
G
A
The relation between the resistance of a metallic conductor and its temperature is used. The increasing of the wind velocity leads to better heat transfer between the conductor and the environment and thus the current intensity would also increase.
When there is air resistance force it causes extra pressure on the liquid in the leg of the manometer tube and so the level of the liquid is different in different legs of the tube. This difference is measured and wind velocity is calculated.
Prototype model
Structure:
1.Air inlet
2.U-shape tube with liquid in it
3.Liquid (an electrolyte)
4.Anode
5.Cathode
6.Power supply
7.Electrical meter
8.Wind vane
9.Stand
Mode of operation:
The wind gets into the air inlet and puts pressure on it.
The liquid level increases in the right leg.
The electrodes become covered with the electrolyte.
As they are connected in series with the power supply the current appears in the circuit.
It can be measured and wind velocity can be calculated.
The disadvantages of the model:
-Fragile and moving parts, liquid presence.
-Low sensitivity.
-Slowed reaction to wind changes.
-The necessity to rotate in order to measure wind velocity in all directions.
-No protection from mechanical damage.
Future prospects
-The most beautiful and precise is to use the camera matrix that has a lot of pixels – it gives the opportunity to measure the position of the light from the light tube very precise and give the result to the PC.
-The smallest and the lightest would be using MEMS (MicroElectroMechanicalSystems). These small devices (size < 1mm) convert electric energy into mechanical one or backwards. In such a way the same device can be created but much smaller. This could allow to install these devices almost everywhere (houses, cars, planes, ships, computers, cell phones etc.)
-Can be a part of the global meteorological network.
-As a part of it to help to create weather maps, prevent natural disasters.
-The most interesting would be to use the moving laser light and the diffraction grating. The dispersion of the beam would be measured and the result will be calculated.
-The cheapest version can be just fiber cable and instead of the light source, the sunlight would be used(only during the daytime).
-The most economical and ecological version is to use solar batteries to supply the ligh source and to recharge its accumulators (so that it can work at night).
Summary
-The analysis of the wind velocity detectors used in WDEP and existing anemometers was made.
-The new detector was developed that gives the opportunity to get more precise and efficient measurements results and send them to other units of the control system.
-The prototype model of developed anemometer was made.
The working capacity and efficiency was checked experimentally.
The developed detector can be mounted on WDEP, and also can be used in meteorology after insignificant update.
Other possible applications and updates were discussed.

Versatile Wind Velocity and Direction Transducer

Problem Statement

Due to constant wind direction and velocity change, the operation of the windmill generators is often sub optimal.

Such problems as the lack of precision, slow reaction time, inability to work in broad temperature ranges, influence of the environment, complexity of the moving parts and fragility take place in the existing patterns of anemometers.

Purpose

Develop a low cost, combined, reliable and accurate wind force and direction sensor, that has more advantages compared to existing ones.

Hypothesis

Photocells can be used to measure wind velocity and direction. Precision and effectiveness can be provided by electronic data processing.

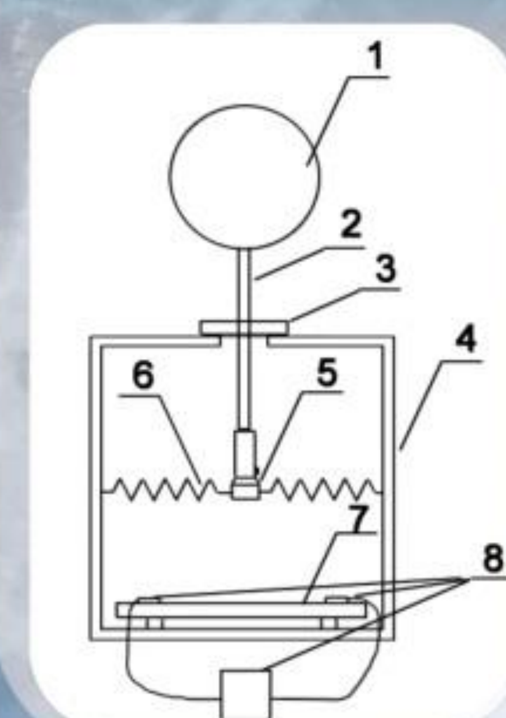
Research Procedure

- analyze the existing patterns of anemometers and find their disadvantages
- develop a new pattern that would have less disadvantages compared to the existing ones
- increase the efficiency and precision of the device
- build an experimental model
- check working capacity and efficiency experimentally
- find possible applications of the device

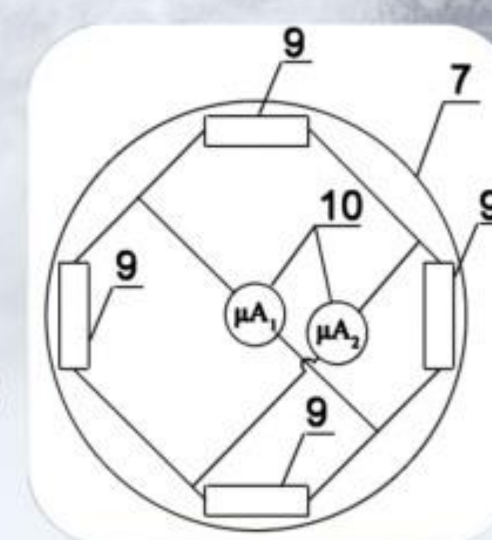
How it works

Wind → Sail → Light position → Photocell array → ADC → Computer → Program → User

Structure



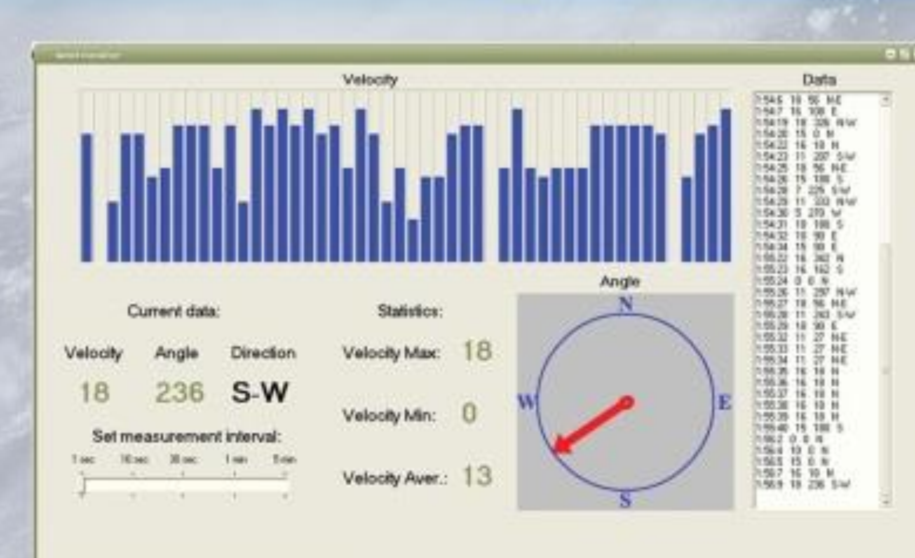
1. Sail
2. Spindle
3. Elastic Gasket ring
4. Shock-protected body
5. Directed light source
6. Springs
7. Recording unit support
8. Recording unit
9. Photocell array
10. Microammeters



Principle of operation

The working principle is based on the spring suspended light source and a photocell array below. Light source is connected with the aerodynamic sail via a spindle shaft assembly fixed to the sensor with a flexible elastic rubber gasket. Photocells detect the light position on the array from the source tilted by the wind and induce signal that is detected and digitized. Tilt angles are calibrated with known wind speeds and included in the software prior to operation.

Supporting Software



- Real-time measurements
- 2 modes of operation
- Check the flow info easily
- Calculate statistics
- Build the table
- Plot the graph
- Send the results to the Web
- Save the results

Application

- Wind-driven electric plants
- Weather stations
- Predicting natural disasters
- Cranes' security system
- Airports
- Safer navigation
- Narrow water-ways
- Anywhere, where it is necessary to measure velocity and direction of gas or liquid flow

Advantages

- 2-in-1: velocity + direction
- High precision and effectiveness
- Long lifetime
- Few moving parts
- No influence of external factors (temperature, air humidity and pressure, etc.)
- Low reaction to wind flaws
- Low price
- Small size & mass
- Damage protection
- Possible for any gas or liquid flow
- Plug & Play interface
- Easy-to-use program
- Ability to save and analyze the results
- USB output gives an opportunity to transfer results in different ways:

Робота над постером

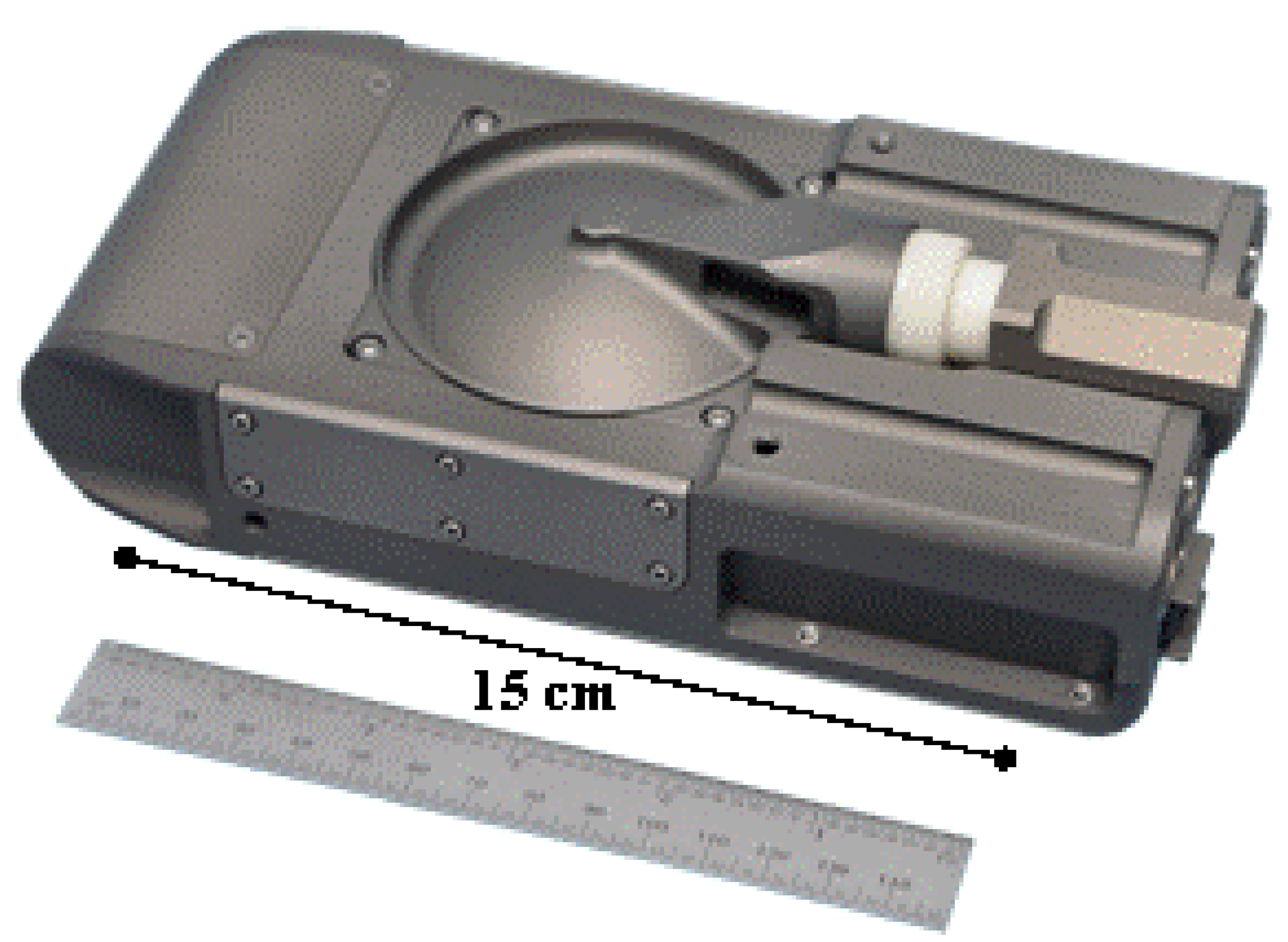
* Плануйте час
* Підготуйте весь матеріал для наповнення
* Виберіть схему постера
* Зробіть ескіз
* Вирішіть питання друку
* Виберіть стиль і колір
* Випробуйте презентацію на друзях, колегах
* Завершіть роботу над постером
* Збережіть елементи і кінцевий варіант постера

Приклади

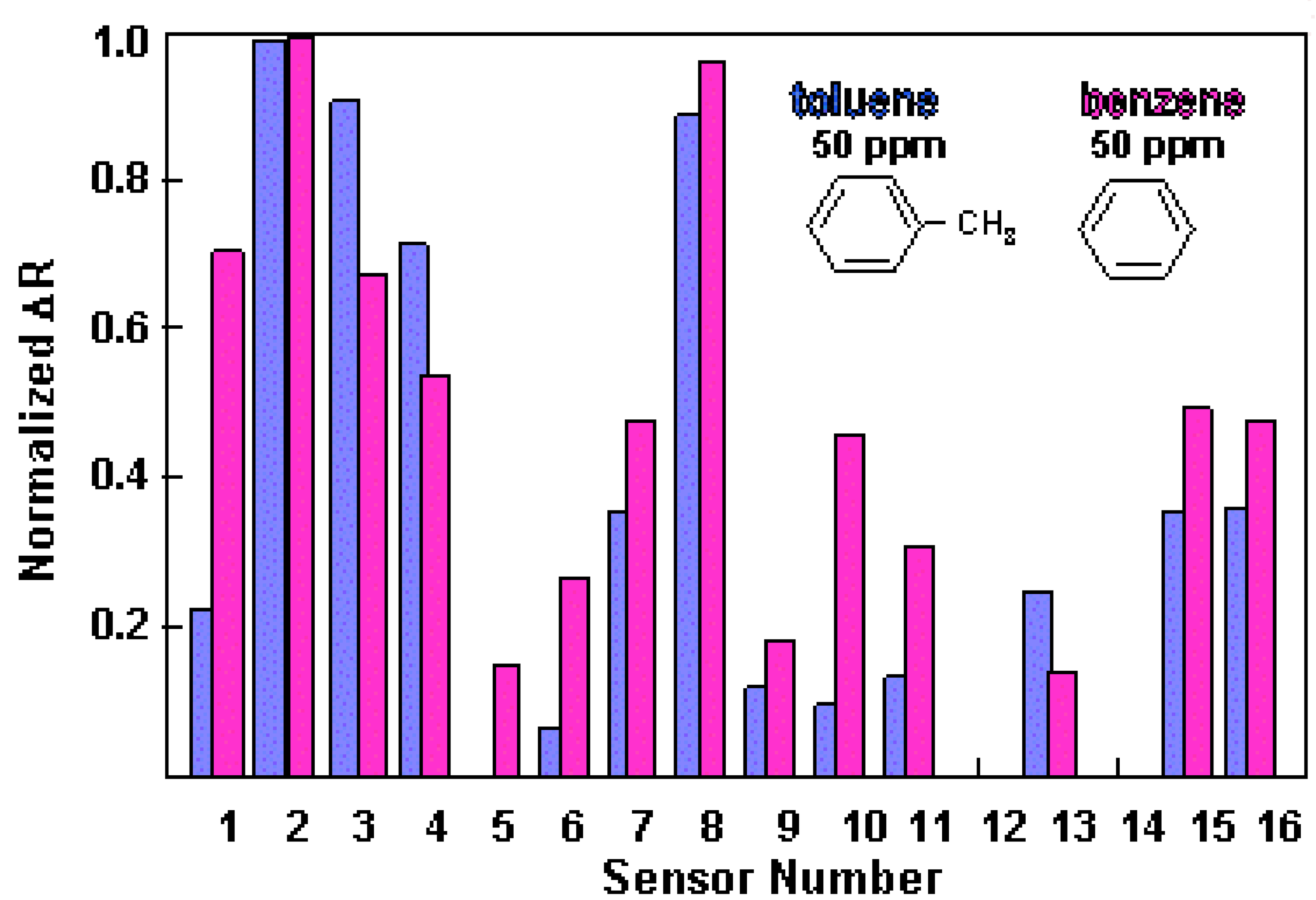
THE JPL ELECTRONIC NOSE (ENOSE)

Jet Propulsion Laboratory
California Institute of Technology

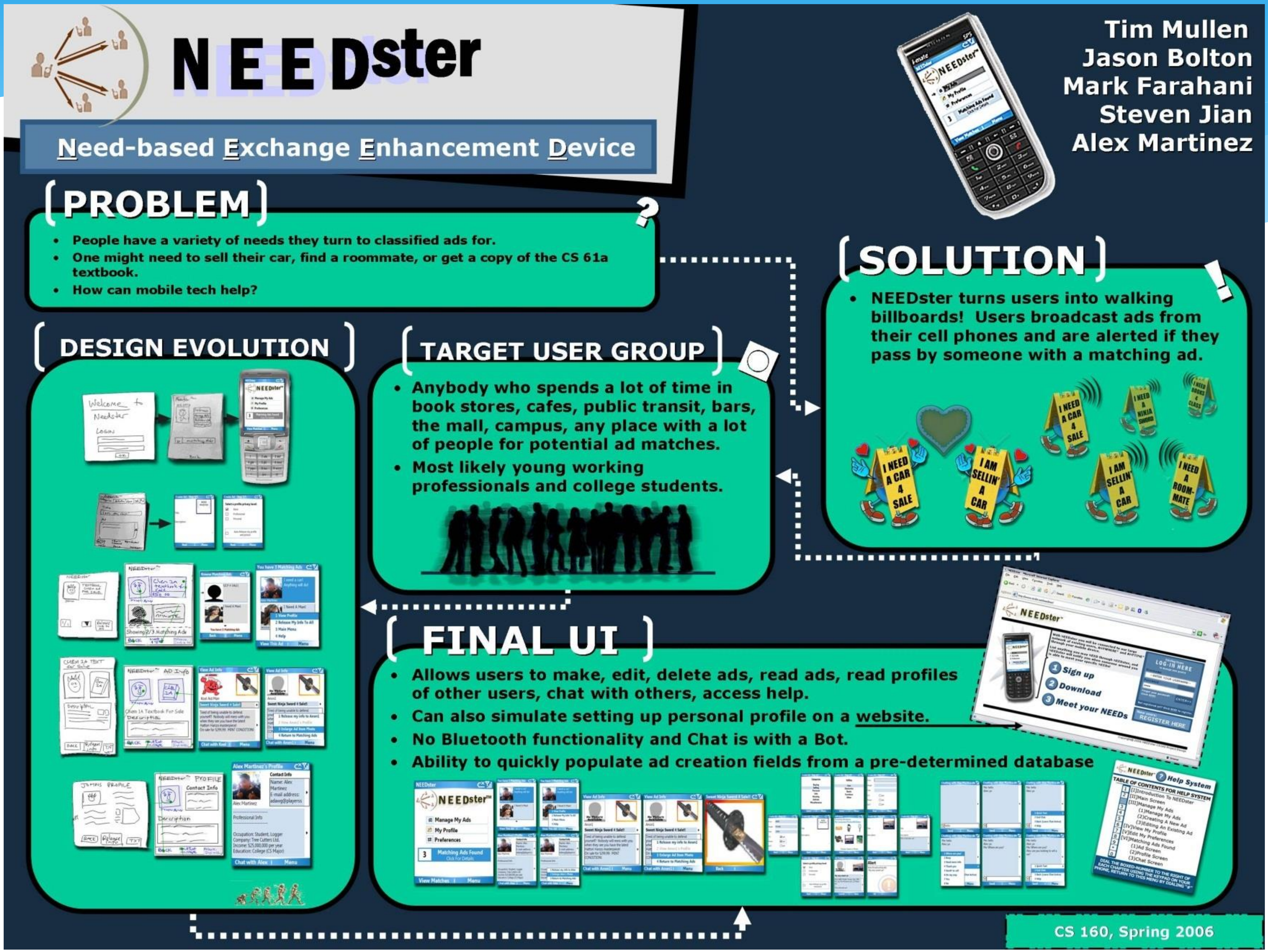
- The JPL ENose provides rapid, early identification and quantification of target chemical species.
- An electronic nose is an array of semi-selective chemical sensors. The JPL ENose is 32 sensors which change electrical resistances when environmental composition changes.
- The sensing array responds in “fingerprint” patterns to a broad suite of target analytes. Fingerprints are deconvoluted for id and quantification.
- Targets include leaks or spills of selected compounds, Hg, SO_2 and possibly heating insulation which signals electrical fires.
- The JPL ENose can be used to monitor cleanup processes.



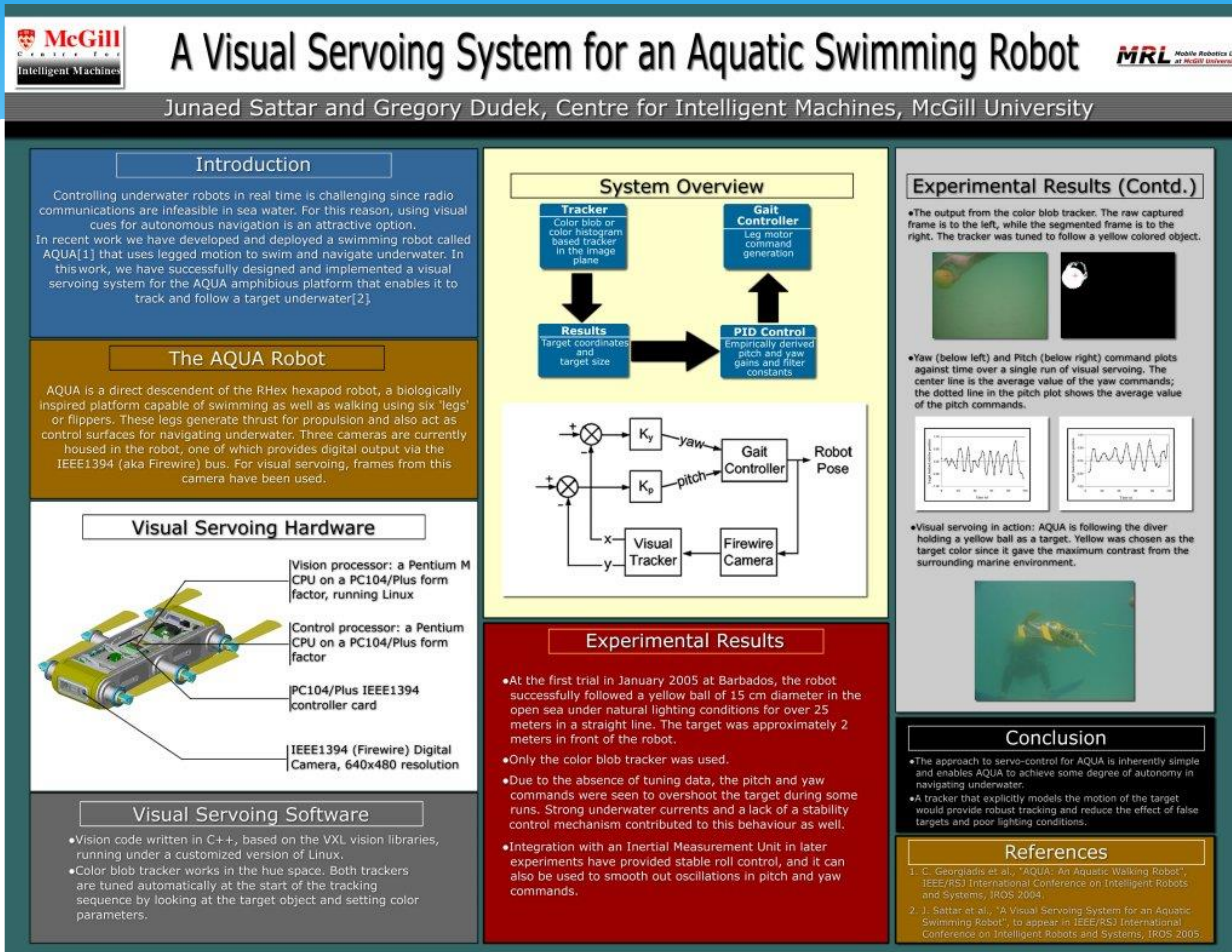
The Third Generation JPL ENose Sensor Unit
Volume ~820 cm³, Mass ~840 g.
A PDA, laptop computer or Interface Unit can be used to record and analyze data in real-time.



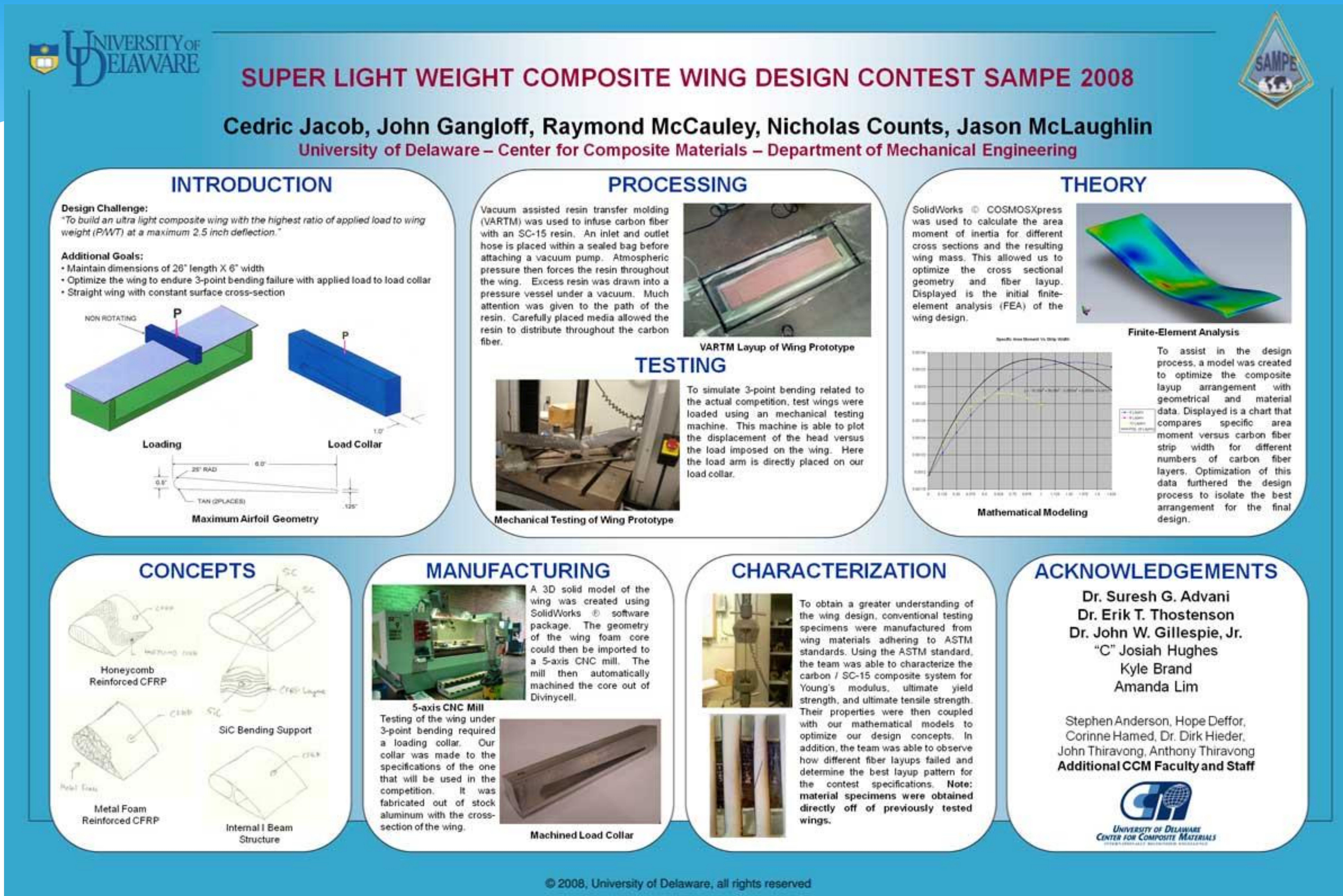
Приклади


NEEDster
Need-based Exchange Enhancement Device
Tim Mullen
Jason Bolton
Mark Farahani
Steven Jian
Alex Martinez
PROBLEM
People have a variety of needs they turn to classified ads for.
One might need to sell their car, find a roommate, or get a copy of the CS 61a textbook.
How can mobile tech help?
SOLUTION
NEEDster turns users into walking billboards! Users broadcast ads from their cell phones and are alerted if they pass by someone with a matching ad.
DESIGN EVOLUTION
TARGET USER GROUP
Anybody who spends a lot of time in book stores, cafes, public transit, bars, the mall, campus, any place with a lot of people for potential ad matches.
Most likely young working professionals and college students.
FINAL UI
Allows users to make, edit, delete ads, read ads, read profiles of other users, chat with others, access help.
Can also simulate setting up personal profile on a website.
No Bluetooth functionality and Chat is with a Bot.
Ability to quickly populate ad creation fields from a pre-determined database
CS 160, Spring 2006

Приклади


McGill
Centre for Intelligent Machines
A Visual Servoing System for an Aquatic Swimming Robot
MRL Mobile Robotics Lab at McGill University
Junaed Sattar and Gregory Dudek, Centre for Intelligent Machines, McGill University
Introduction
Controlling underwater robots in real time is challenging since radio communications are infeasible in sea water. For this reason, using visual cues for autonomous navigation is an attractive option.
In recent work we have developed and deployed a swimming robot called AQUA[1] that uses legged motion to swim and navigate underwater. In this work, we have successfully designed and implemented a visual servoing system for the AQUA amphibious platform that enables it to track and follow a target underwater[2].
The AQUA Robot
AQUA is a direct descendent of the RHex hexapod robot, a biologically inspired platform capable of swimming as well as walking using six 'legs' or flippers. These legs generate thrust for propulsion and also act as control surfaces for navigating underwater. Three cameras are currently housed in the robot, one of which provides digital output via the IEEE1394 (aka Firewire) bus. For visual servoing, frames from this camera have been used.
Visual Servoing Hardware
Vision processor: a Pentium M CPU on a PC104/Plus form factor, running Linux
Control processor: a Pentium CPU on a PC104/Plus form factor
PC104/Plus IEEE1394 controller card
IEEE1394 (Firewire) Digital Camera, 640x480 resolution
Visual Servoing Software
•Vision code written in C++, based on the VXL vision libraries, running under a customized version of Linux.
•Color blob tracker works in the hue space. Both trackers are tuned automatically at the start of the tracking sequence by looking at the target object and setting color parameters.
System Overview
Tracker
Color blob or color histogram based tracker in the image plane
Gait Controller
Leg motor command generation
Results
Target coordinates and target size
PID Control
Empirically derived pitch and yaw gains and filter constants
Ky
Kp
yaw
pitch
Gait Controller
Robot Pose
Visual Tracker
Firewire Camera
x
y
Experimental Results
•At the first trial in January 2005 at Barbados, the robot successfully followed a yellow ball of 15 cm diameter in the open sea under natural lighting conditions for over 25 meters in a straight line. The target was approximately 2 meters in front of the robot.
•Only the color blob tracker was used.
•Due to the absence of tuning data, the pitch and yaw commands were seen to overshoot the target during some runs. Strong underwater currents and a lack of a stability control mechanism contributed to this behaviour as well.
•Integration with an Inertial Measurement Unit in later experiments have provided stable roll control, and it can also be used to smooth out oscillations in pitch and yaw commands.
Experimental Results (Contd.)
•The output from the color blob tracker. The raw captured frame is to the left, while the segmented frame is to the right. The tracker was tuned to follow a yellow colored object.
•Yaw (below left) and Pitch (below right) command plots against time over a single run of visual servoing. The center line is the average value of the yaw commands; the dotted line in the pitch plot shows the average value of the pitch commands.
•Visual servoing in action: AQUA is following the diver holding a yellow ball as a target. Yellow was chosen as the target color since it gave the maximum contrast from the surrounding marine environment.
Conclusion
•The approach to servo-control for AQUA is inherently simple and enables AQUA to achieve some degree of autonomy in navigating underwater.
•A tracker that explicitly models the motion of the target would provide robust tracking and reduce the effect of false targets and poor lighting conditions.
References
1. C. Georgiadis et al., "AQUA: An Aquatic Walking Robot", IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2004.
2. J. Sattar et al., "A Visual Servoing System for an Aquatic Swimming Robot", to appear in IEEE/RSJ International Conference on Intelligent Robots and Systems, IROS 2005.

Приклади



UNIVERSITY OF DELAWARE
SUPER LIGHT WEIGHT COMPOSITE WING DESIGN CONTEST SAMPE 2008
SAMPE
Cedric Jacob, John Gangloff, Raymond McCauley, Nicholas Counts, Jason McLaughlin
University of Delaware – Center for Composite Materials – Department of Mechanical Engineering
INTRODUCTION
Design Challenge:
"To build an ultra light composite wing with the highest ratio of applied load to wing weight (P/WT) at a maximum 2.5 inch deflection."
Additional Goals:
• Maintain dimensions of 26" length X 6" width
• Optimize the wing to endure 3-point bending failure with applied load to load collar
• Straight wing with constant surface cross-section
NON ROTATING
P
P
Loading
Load Collar
Maximum Airfoil Geometry
PROCESSING
Vacuum assisted resin transfer molding (VARTM) was used to infuse carbon fiber with an SC-15 resin. An inlet and outlet hose is placed within a sealed bag before attaching a vacuum pump. Atmospheric pressure then forces the resin throughout the wing. Excess resin was drawn into a pressure vessel under a vacuum. Much attention was given to the path of the resin. Carefully placed media allowed the resin to distribute throughout the carbon fiber.
VARTM Layup of Wing Prototype
TESTING
To simulate 3-point bending related to the actual competition, test wings were loaded using an mechanical testing machine. This machine is able to plot the displacement of the head versus the load imposed on the wing. Here the load arm is directly placed on our load collar.
Mechanical Testing of Wing Prototype
THEORY
SolidWorks © COSMOSXpress was used to calculate the area moment of inertia for different cross sections and the resulting wing mass. This allowed us to optimize the cross sectional geometry and fiber layup. Displayed is the initial finite-element analysis (FEA) of the wing design.
Finite-Element Analysis
To assist in the design process, a model was created to optimize the composite layup arrangement with geometrical and material data. Displayed is a chart that compares specific area moment versus carbon fiber strip width for different numbers of carbon fiber layers. Optimization of this data furthered the design process to isolate the best arrangement for the final design.
Mathematical Modeling
CONCEPTS
Honeycomb Reinforced CFRP
SiC Bending Support
Metal Foam Reinforced CFRP
Internal I Beam Structure
MANUFACTURING
A 3D solid model of the wing was created using SolidWorks ® software package. The geometry of the wing foam core could then be imported to a 5-axis CNC mill. The mill then automatically machined the core out of Divinycell.
5-axis CNC Mill
Testing of the wing under 3-point bending required a loading collar. Our collar was made to the specifications of the one that will be used in the competition. It was fabricated out of stock aluminum with the cross-section of the wing.
Machined Load Collar
CHARACTERIZATION
To obtain a greater understanding of the wing design, conventional testing specimens were manufactured from wing materials adhering to ASTM standards. Using the ASTM standard, the team was able to characterize the carbon / SC-15 composite system for Young's modulus, ultimate yield strength, and ultimate tensile strength. Their properties were then coupled with our mathematical models to optimize our design concepts. In addition, the team was able to observe how different fiber layups failed and determine the best layup pattern for the contest specifications. Note: material specimens were obtained directly off of previously tested wings.
ACKNOWLEDGEMENTS
Dr. Suresh G. Advani
Dr. Erik T. Thostenson
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Kyle Brand
Amanda Lim
Stephen Anderson, Hope Deffor, Corinne Hamed, Dr. Dirk Hieder, John Thiravong, Anthony Thiravong
Additional CCM Faculty and Staff
University of Delaware Center for Composite Materials
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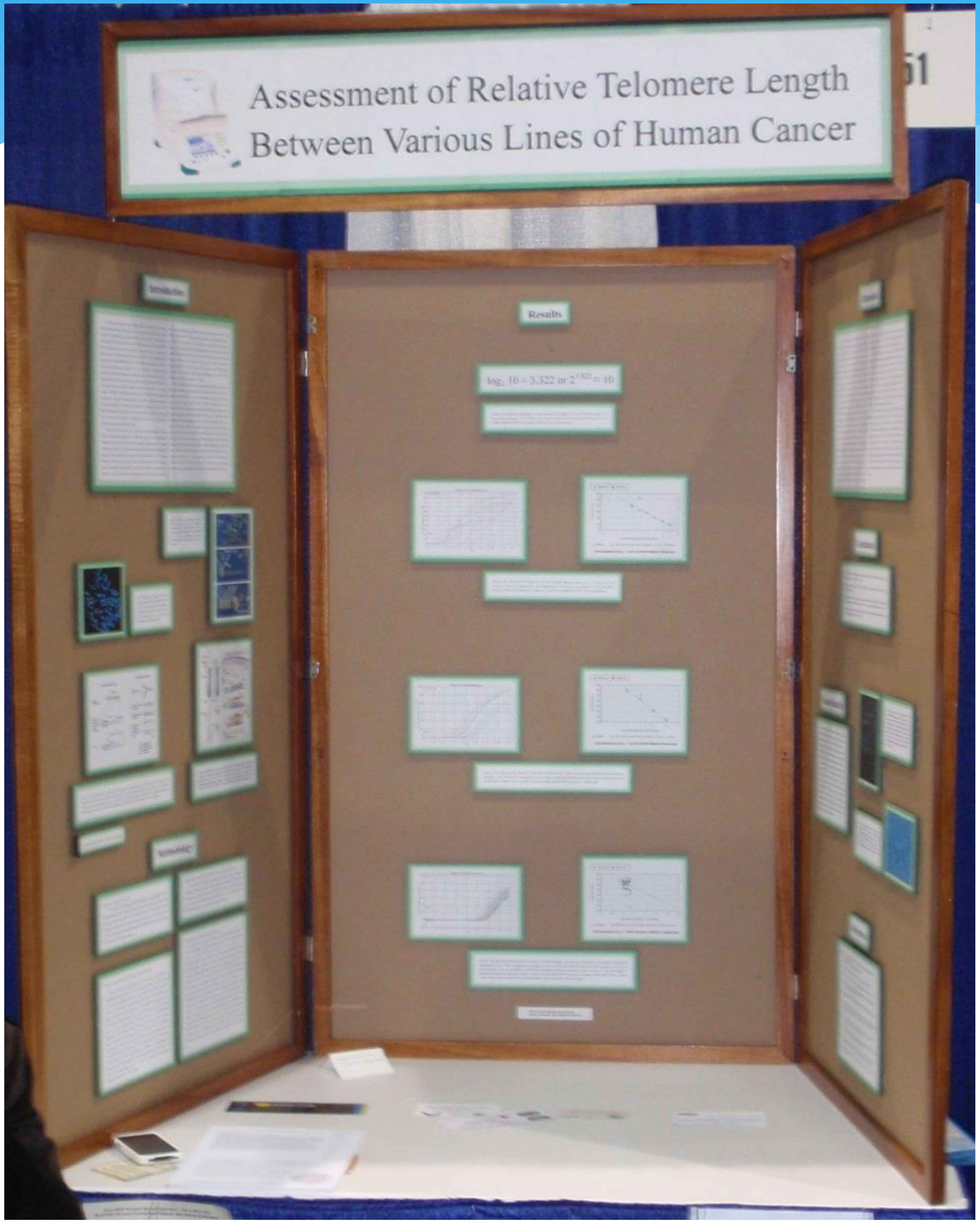
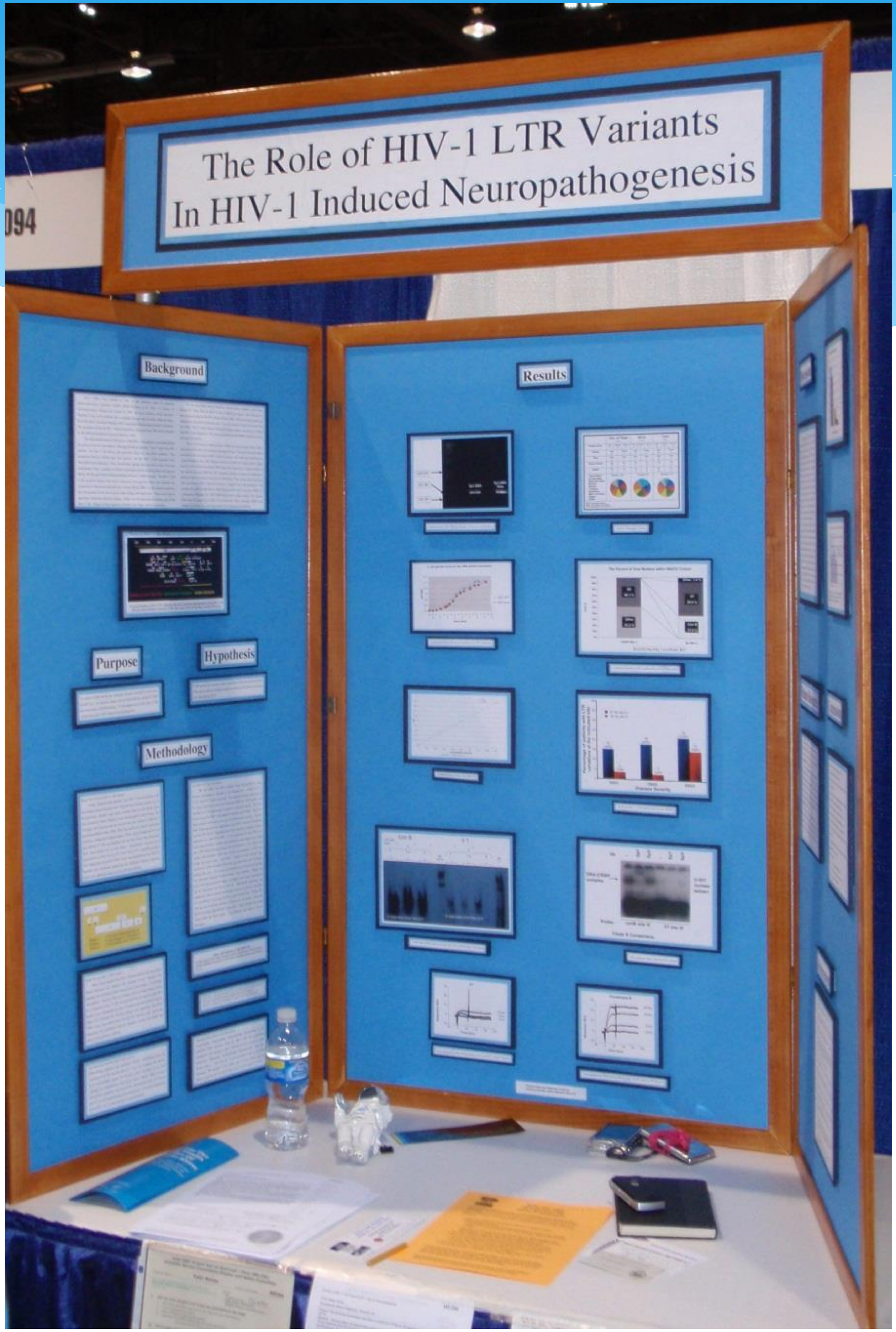
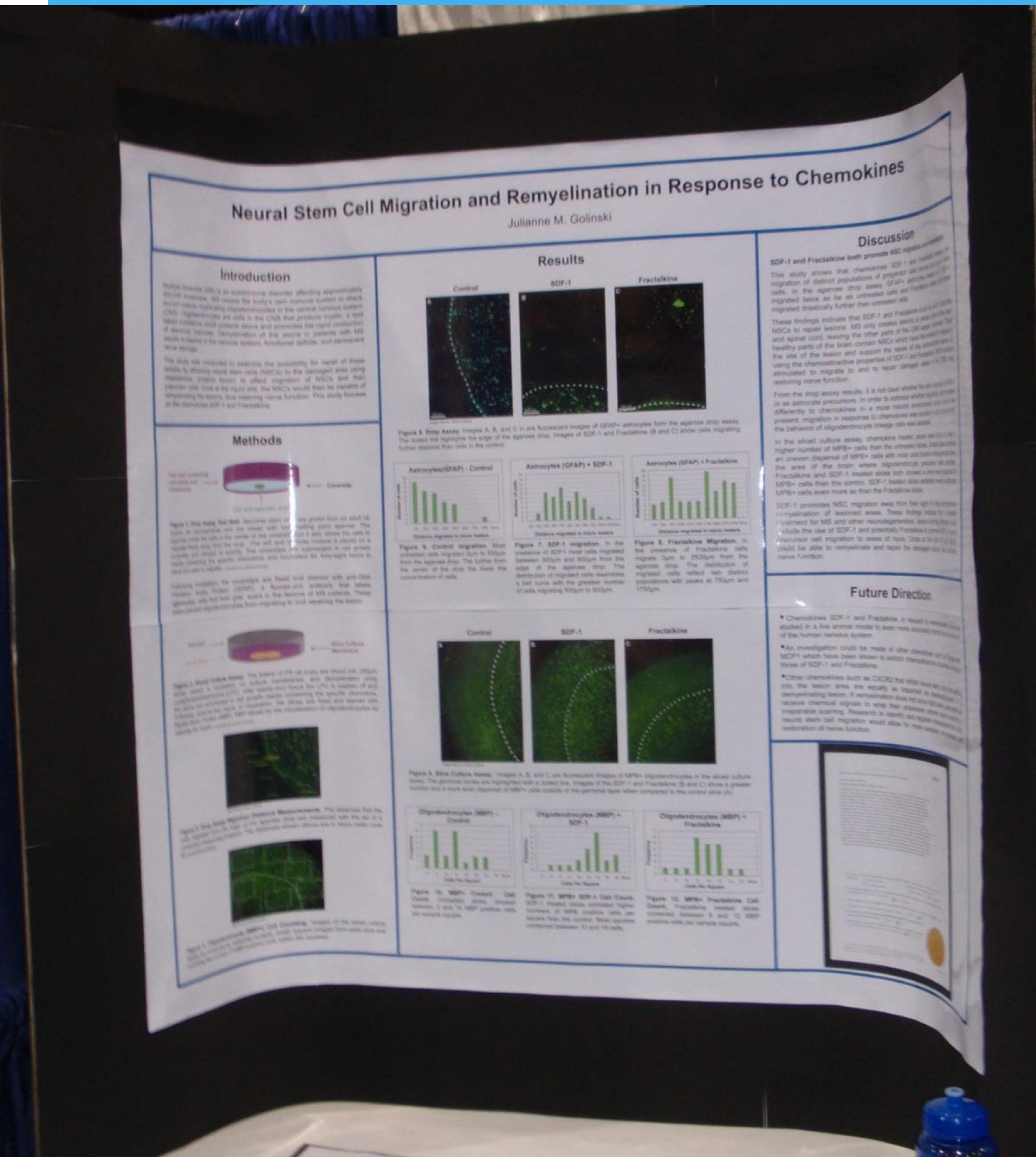
Приклади

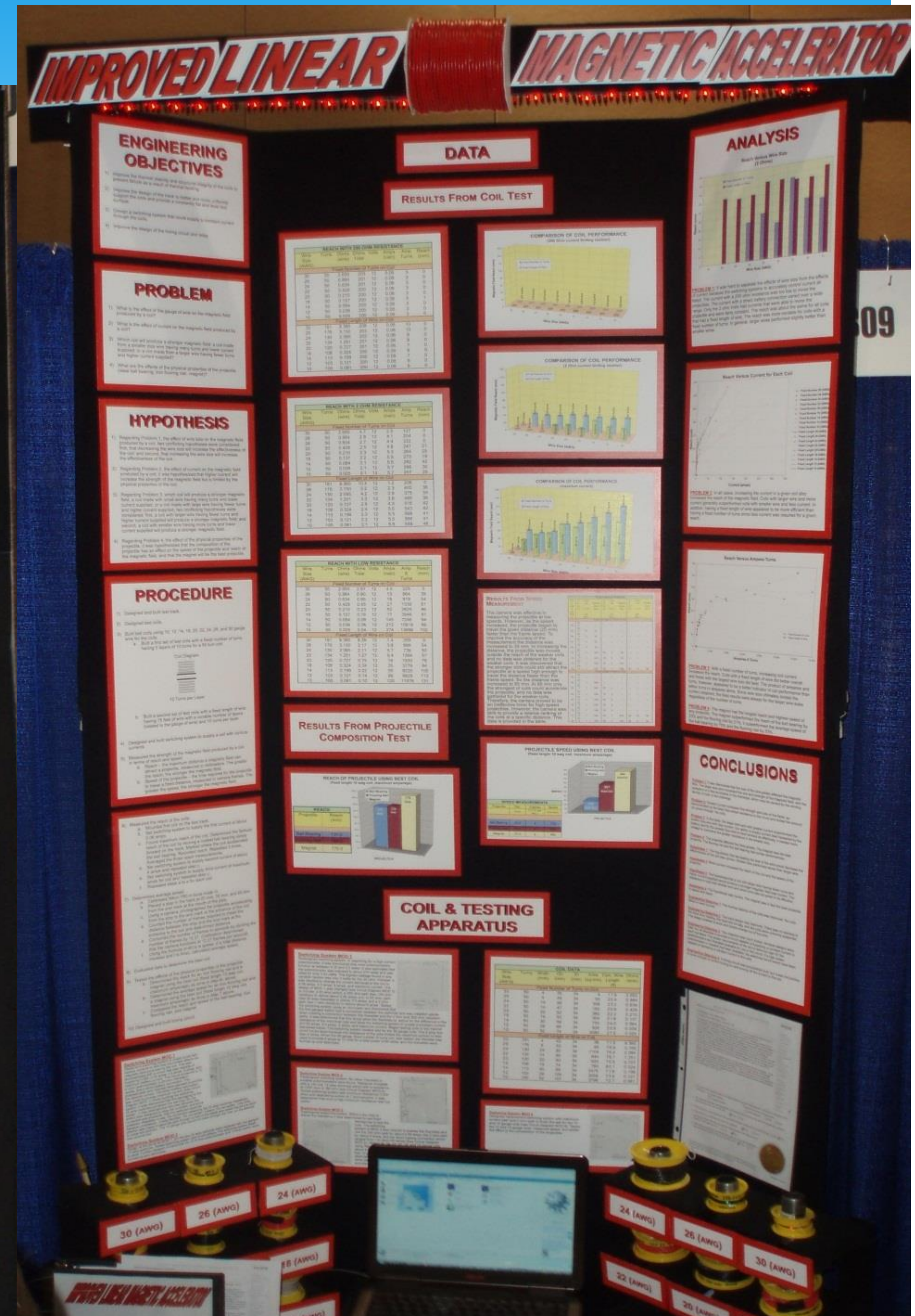

Assessment of Relative Telomere Length
Between Various Lines of Human Cancer
Results


The Role of HIV-1 LTR Variants
In HIV-1 Induced Neuropathogenesis
Background
Results
Purpose
Hypothesis
Methodology

Приклади

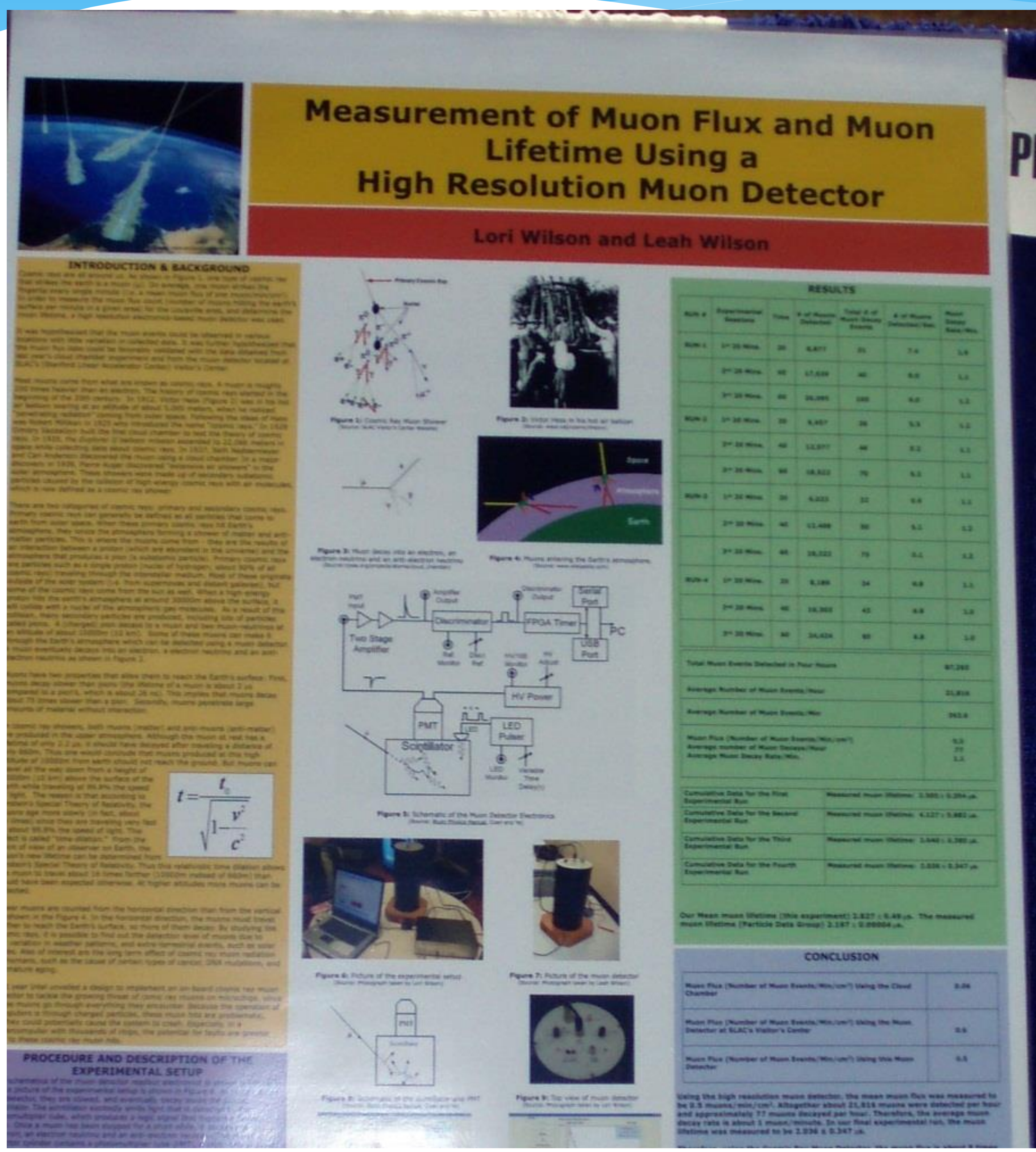


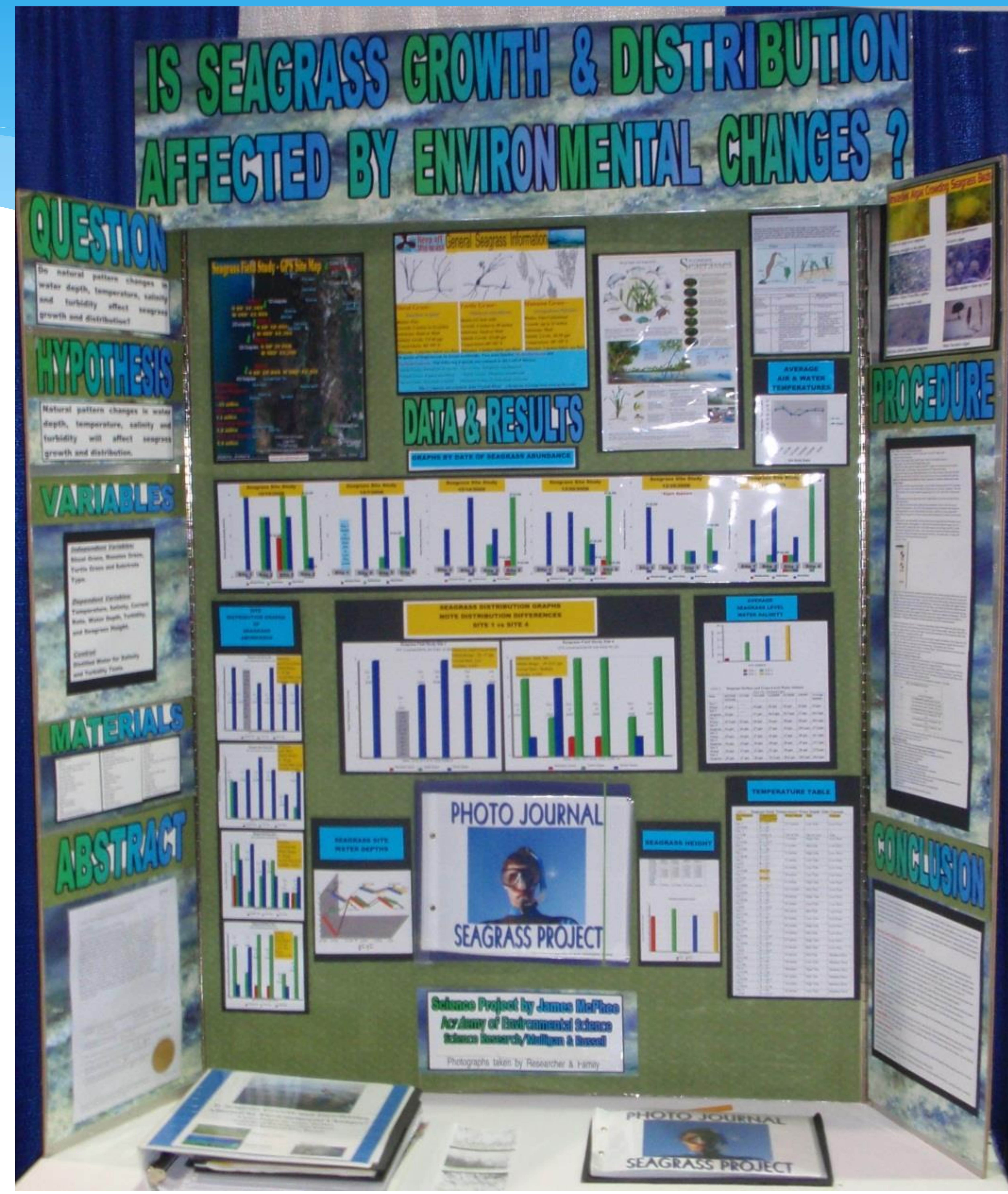
Neural Stem Cell Migration and Remyelination in Response to Chemokines
Julianne M. Golinski
Introduction
Results
Discussion
Methods
Future Direction



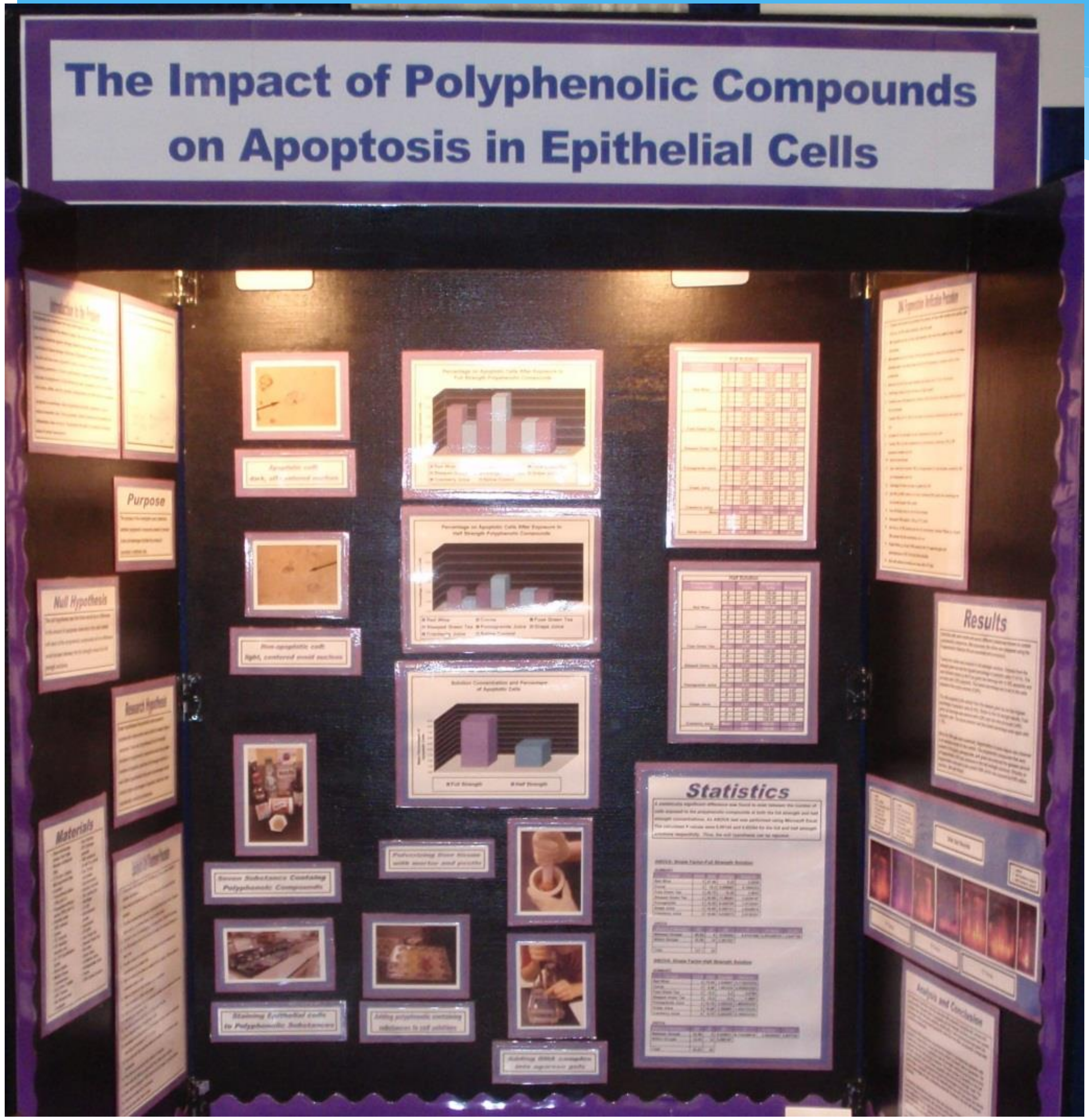
IMPROVED LINEAR
MAGNETIC ACCELERATOR
ENGINEERING OBJECTIVES
DATA
RESULTS FROM COIL TEST
ANALYSIS
PROBLEM
HYPOTHESIS
PROCEDURE
RESULTS FROM PROJECTILE COMPOSITION TEST
CONCLUSIONS
COIL & TESTING APPARATUS
30 (AWG)
26 (AWG)
24 (AWG)

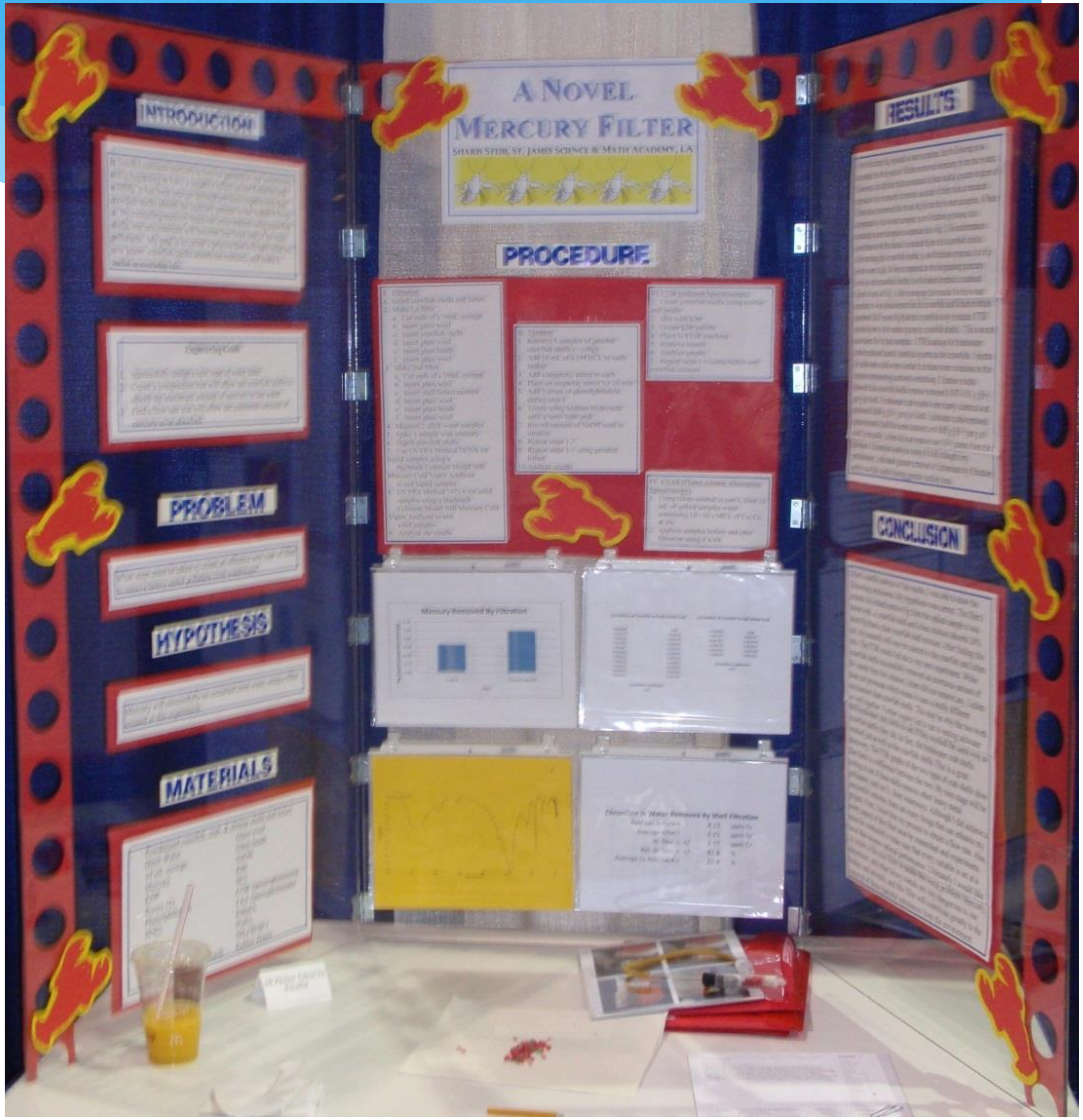
Приклади


Measurement of Muon Flux and Muon Lifetime Using a High Resolution Muon Detector
Lori Wilson and Leah Wilson
INTRODUCTION & BACKGROUND
RESULTS
CONCLUSION

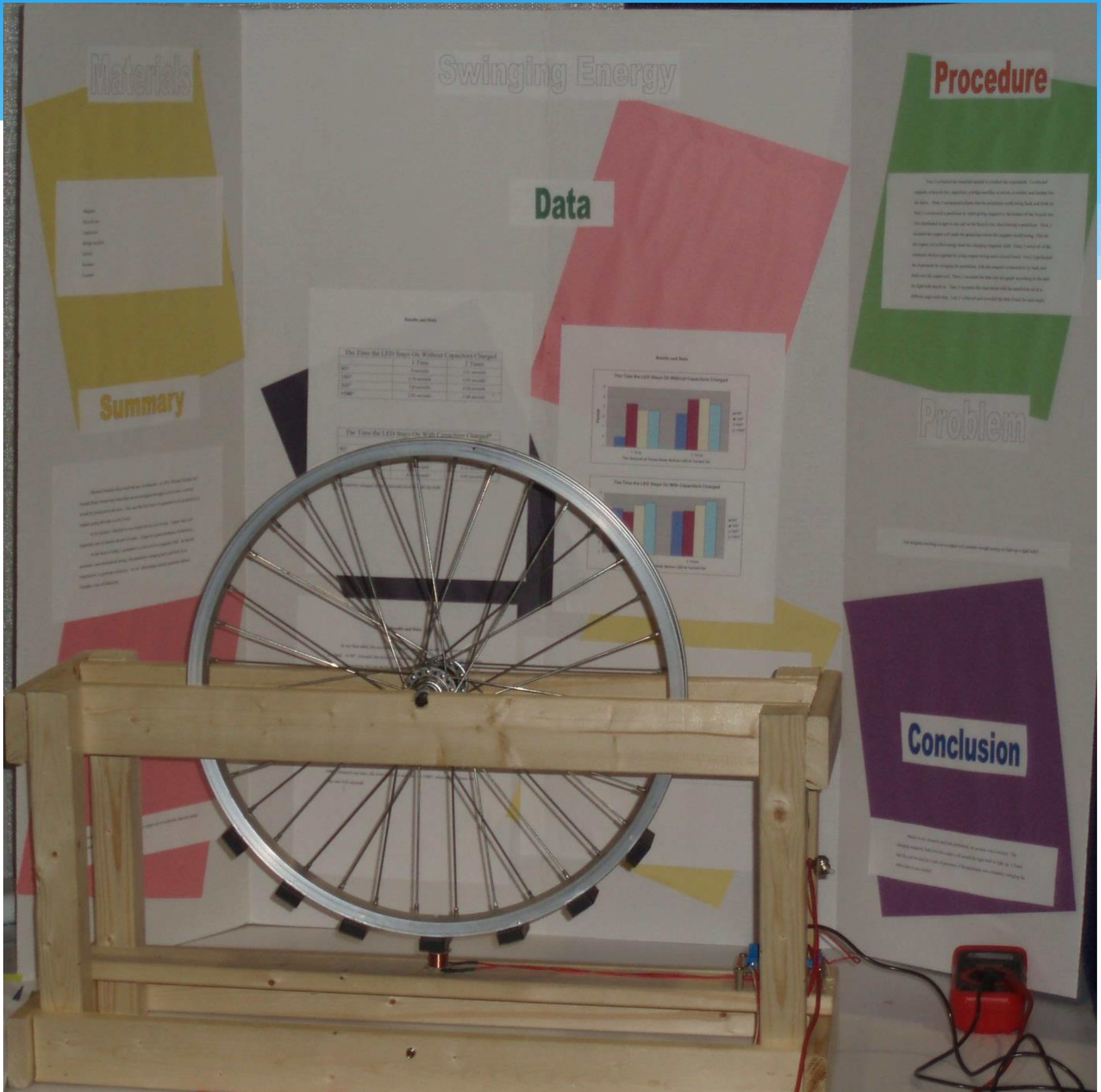

IS SEAGRASS GROWTH & DISTRIBUTION AFFECTED BY ENVIRONMENTAL CHANGES ?
QUESTION
Do natural pattern changes in water depth, temperature, salinity and turbidity affect seagrass growth and distribution?
HYPOTHESIS
Natural pattern changes in water depth, temperature, salinity and turbidity will affect seagrass growth and distribution.
VARIABLES
MATERIALS
ABSTRACT
DATA & RESULTS
PROCEDURE
CONCLUSION
PHOTO JOURNAL
SEAGRASS PROJECT

Приклади

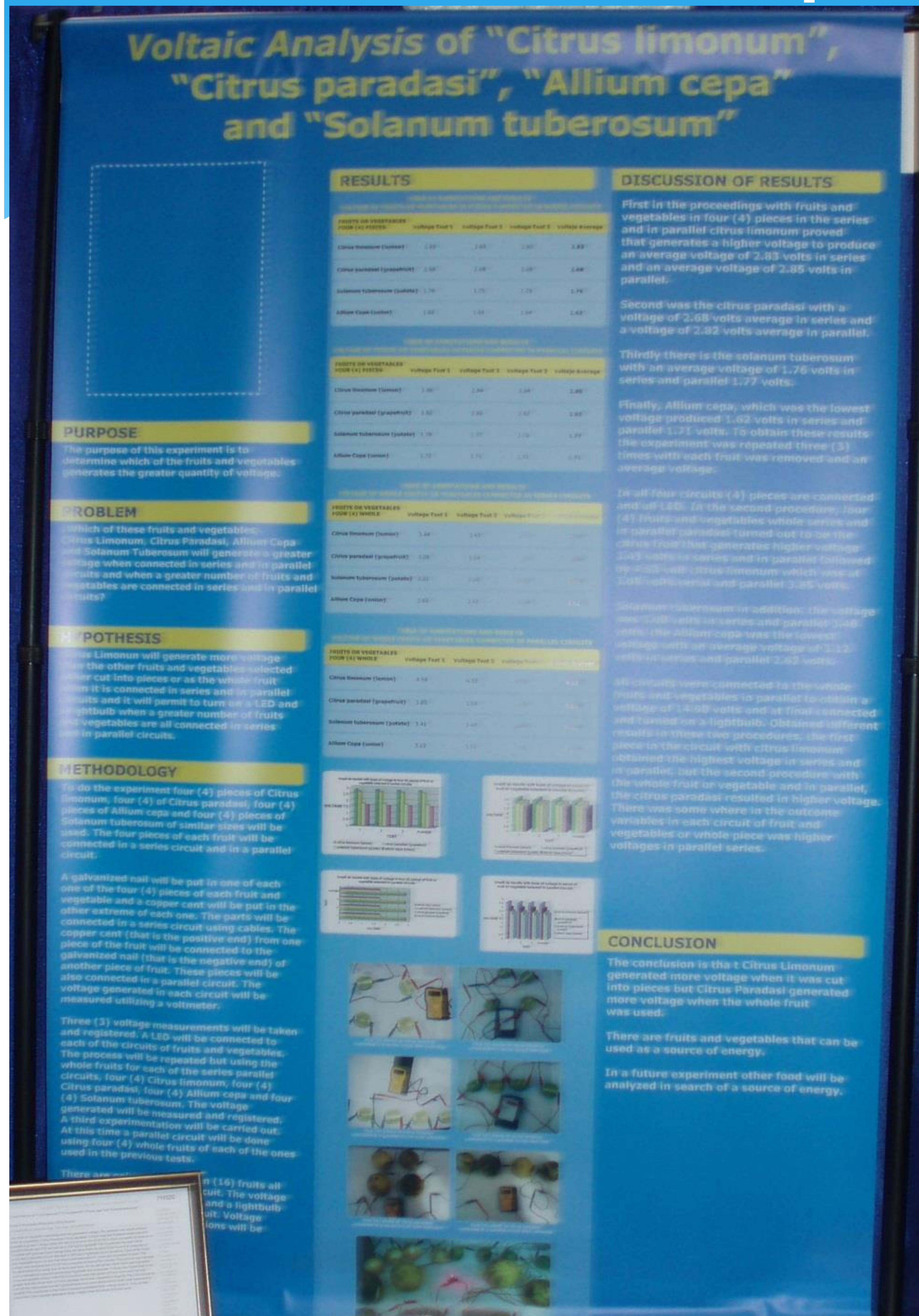

The Impact of Polyphenolic Compounds
on Apoptosis in Epithelial Cells
Purpose
Null Hypothesis
Research Hypothesis
Materials
Results
Statistics
Analysis and Conclusion


A NOVEL
MERCURY FILTER
INTRODUCTION
PROCEDURE
RESULTS
PROBLEM
HYPOTHESIS
MATERIALS
CONCLUSION

Приклади


Materials
Swinging Energy
Procedure
Data
Summary
Problem
Conclusion

Приклади


Voltaic Analysis of "Citrus limonum", "Citrus paradasi", "Allium cepa" and "Solanum tuberosum"
RESULTS
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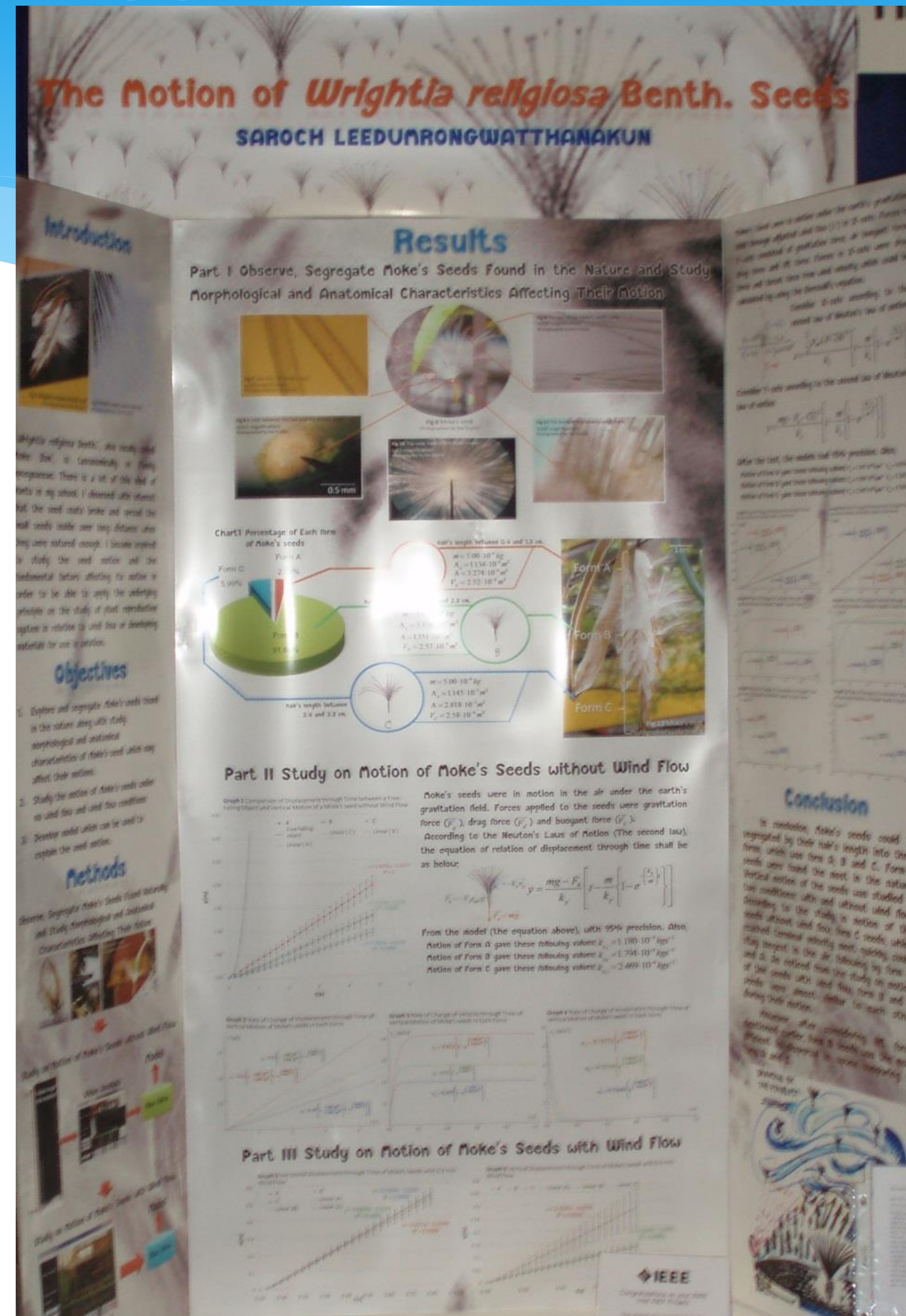
The Motion of Wrightia religiosa Benth. Seeds
SAROCH LEEDUMRONGWATTHANAKUN
Introduction
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Бажаємо успіхів!

Дякуємо за увагу!