



# Basics Of Scientific Research 4:

## Presentation skills - How to design a professional scientific poster?

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# Outline

1. Poster Specifications
2. Poster Structure
3. Effective Poster Design: Tips and Guidelines
  - a) Layout
  - b) Fonts
  - c) Colors
  - d) Text boxes and spaces
  - e) Graphics
4. Before Printing
5. Assess your poster
6. Poster Presentation

**How does an effective  
poster look like?**



## VIDEO ENCRYPTION

submitted for MTH217 project

Submitted to :

Prof. Ahmed G.Radwan

Dr. Samah El-Tantawy



Department of Electronics and  
Electrical Communications Engineering  
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## Be Careful! You have been Hacked

### ABSTRACT

Everything in our life depends on Math; Encryption is a good application of linear algebra and other mathematical topics. Video encryption is an important branch of data encryption or "multimedia security" field which interests in protection of data and information.

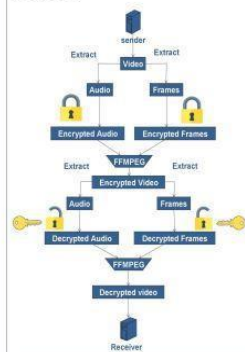
### INTRODUCTION

There is a huge number of videos transfer between users in networks and the problem is how to make these video transfer safely. Video encryption is a very substantial part of multimedia security and is used in a lot of applications which required a high standard of security.



### VIDEO ENCRYPTION PROCESS

Because the video is a combination of images and audio, the process steps are as follows :



### ALGORITHM

There is a lot of encryption algorithms, here is a comparison between the most popular algorithms:

|            | DES                    | AES                    | IDEA                               |
|------------|------------------------|------------------------|------------------------------------|
| Developed  | 1977                   | 2000                   | 1990                               |
| Key Length | 56 bits                | 128, 192, or 256 bits  | 128 bits                           |
| Structure  | Symmetric block cipher | Symmetric block cipher | Substitution Permutation Structure |
| Block Size | 64 bits                | 128 bits               | 64 bits                            |
| Security   | Proven inadequate      | Considered secure      |                                    |

### RC4 ALGORITHM

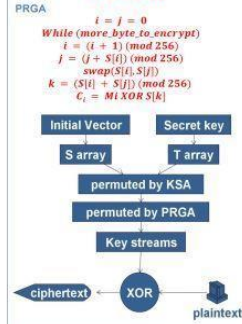
RC4 is a stream cipher algorithm, based on the usage of a random permutation. We use in our project RC4 algorithm Because:

1-It is very fast. 2-More secure.

```

KSA
for i = 0 to 255 do
  S[i] = i
  j = 0
  for i = 0 to 255 do
    j = (j + S[i] + T(i)) mod 256
    swap(S[i], S[j])
  end for
end for
PRGA
i = j = 0
While (more byte to encrypt)
  i = (i + 1) mod 256
  j = (j + S[i]) mod 256
  swap(S[i], S[j])
  k = (S[i] + S[j]) mod 256
  Ct = MIXOR(S[k])
end While

```



### REFERENCES

- 1."Symmetric vs. Asymmetric Encryption - What are differences?", SSL2BUY Wiki - Get Solution for SSL Certificate Queries, 2017.
2. P. Generation and Stallings, "PRINCIPLES OF PSEUDORANDOM NUMBER GENERATION", BrainKart, 2017.
3. A. Mousa and A. Hamad, Evaluation of the RC4 Algorithm for Data Encryption, Nablus, Palestine: PalTel Company, 2016, pp. 44-51, 226-231.

# PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS

## ABSTRACT:

One ignored benefit of space travel is a potential alleviation of obesity, a chronic problem for a growing minority in many parts of the world. In theory, weight is expected to be a function of diet. In theory, weight is expected to be a function of diet.

Colin B. Purrington\*

6673 College Avenue, Swarthmore, PA 19081 USA

## SPACEFOXES

## INTRODUCTION:

The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and raised stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new outfits. Indeed, exercise today for hundreds of million people involve only the act of wearing stretchy pants in public, presumably because the compressive pressure forces fat molecules to adopt a more compact tertiary structure (Kuvier 1965).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their ships with seat belts and sticky boots. The potential application to weight loss was noted immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating new ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as lord of all stature feeding. Guinea pigs were long envisioned to be the "Guinea pig" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.

## MATERIALS AND METHODS:

One hundred male and one hundred female Guinea pigs (*Cavia porcellus*) were transported to the International Space Laboratory in 2010. Each pig was housed separately and deprived of exercise wheels and fresh fruits and vegetables for 48 months. Each month, pigs were individually weighed by duck-taping them to an electronic balance sensitive to 0.0001 grams. Back on Earth, an identical cohort was similarly maintained and weighed. Data was analyzed by statistics.

## RESULTS:

Mean weight of pigs in space was 0.0000 +/- 0.0002 g. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duck tape, we believe, which caused them to be alarmed push briefly against the force plate in the balance. Individuals on the Earth, the control cohort, gained about 540 grams (g +/- 0.0002). Males and females gained a similar amount of weight on Earth (no main effect of sex), and size at any point during the study was related to starting size (which was used as a covariate in the ANCOVAs). Both Earth and space pigs developed substantial deposits (double chins) and were lethargic at the conclusion of the study.

## CONCLUSIONS:

and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in us. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 30 years, pending expedited review by local and

## EDGEMENTS:

ous support from the National Research Foundation, Black Hole in Fructose Sugar Association. Transport flights were funded by millions of wires divorced from heavenly weaving society. Grateful for comments on early drafts by Mathews Kinetic Club. Finally, sincere thanks to the Guy Foundation for generously fund the conclusion of the study.

## LITERATURE CITED:

NASA. 1962. Project STS-XX: Guinea Pigs. Leaked Internal memo. (Revised, G.R., D. D. Lukat, and N. M. Naumov). 2005. The Fetus Gained Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 64:221-229.

Kuvier, M. 1965. Elastane Pynchases Acetylates Weight Gain in Case-control Study. Journal of Obesity. 2:23-40.

### APPLICATIONS

- Video Conferencing.
- Surveillance.
- VDD.
- Pay-TV News



### CONCLUSION & FUTURE WORKS

Video Encryption process improves a lot of applications which depend on transferring videos between different devices and provide them with a high level of security. Now, researches are working on a new types of data encryption algorithms like Quantum cryptography, Honey encryption, Functional encryption and Fully homomorphic encryption where data will be uploaded into a cloud. No one will be able to access it.

### BY

Alaa Osama  
Esraa Amr  
Esraa Khaled  
Esraa M.Abd El Fatah  
Esraa M.Ismail

# Creating a Poster

- Design your own template or modify an existing one using MS PowerPoint
- Other poster production tools:
  - Word Processor (Word, Pages, OpenOffice Writer)
  - Presentation Software (e.g., PowerPoint, Keynote, Impress)
  - Vector Graphics (e.g., Illustrator, Inkscape, OpenOffice Draw)
  - Desktop Publishing (e.g. Photoshop, Publisher, In Design)
- For LaTeX users:
  - You may prepare your oral presentation using beamer
  - You may use a poster template on it as well ...

# Poster Specifications

- Poster size A0 (i.e., dimensions 33.1 x 46.8 in = 841 x 1189 mm)
- Portrait orientation
- Include the faculty logo, TCCD logo, course code, team logo, team names and contact, course instructor name, title of the project, ...
- Same structure of the report
- More concise
  - Text/graphics balance
  - Can text be replaced by graphics?

# Poster Structure

- Title: may be rephrased
- Logos and information
- Abstract
- Problem Definition:
  - What is the problem you are solving?
  - Why is it interesting and important?
  - What makes it challenging to solve?
- Methods of Solution:
  - Which algorithms/techniques/models did you use/develop? Be as specific!
  - How did you address the problem? Provide algorithm flowchart with a description of your algorithm/method
- Data Description
  - What data did you use to test your method?
- Analysis of the Results:
  - How did you assess the performance of your method? Provide appropriate graphical representation
- Conclusions and Future Work:
  - What are your conclusions and recommendations for future work?
- References, not necessarily all
- Preferably, scanning from top left to bottom right



# General Tips

- Design poster to be easily seen and easily scanned by eye
- Bear in mind that your poster will be viewed from distances of 1 - 2 meters
- Make it self-explanatory
- Focus on the central question and take-home message (use and repeat key words)
- Aim to limit text, yet, scientific posters generally require more text than other disciplines
- Avoid overcrowding
- Use bullet points not sentences: short, informative
- Use simple and clear language but keep it correct



# Again, Effective Poster Design

- ***Overall appearance.*** Use a pleasing arrangement of graphics, text, colors. Your poster should be neat and uncluttered – use white space to help organize sections. Balance the placement of text and figures.
- ***Organization.*** Use headings to help readers find what they're looking for: objective, results, conclusions, etc. A columnar format helps traffic flow in a crowded poster session.
- ***Text size.*** All text should be large enough to read from 1-2 meters, including the text in figures. Title should be larger, to attract attention from far away.
- ***Use color cautiously.*** Dark letters on light background are easiest to read. Stick to a theme of 2-3 colors. Avoid overly bright colors – they attract attention but wear out reader's eyes.
- ***Don't fight reader gravity,*** which pulls the eyes from top to bottom (first), and left to right.

# Detailed: Layout

- Title should be across the whole width of the poster, as possible
- Sketch a rough layout of your poster
- Organize columns, text boxes and graphics
- 2 columns for a “portrait” oriented poster
- 3 columns for a “landscape” oriented poster
- The order of reading should be logical, better down columns rather than across rows:  
you can indicate (by numbers, letters or arrows) a sequence to be followed in studying your material

# Detailed: Fonts

## Font Types:

- Use no more than 3 different fonts (usually 2)
- Choose fonts that enlarge well
- In general, use non-serif fonts (e.g., Helvetica) for titles and headings and serif fonts (e.g. Palatino) for body text

## Font Sizes:

- Title: 120-200 pt
- Sub-headings: 48 pt
- Main text: 28-36 pt
- Graphs: clearly labeled diagrams 24-26 pt

## Font Styles:

- Restrict boldface to title or headings
- Don't underline
- Avoid italics as much as possible
- Don't use all UPPERCASE

# Detailed: Colors

- Choose colors wisely
- Aim for contrast
- Don't let use of color or your background detract from the message
- Don't combine either primary colors or complementary colors
  - primary = red, green, blue (especially red and green)
  - complementary = cyan, magenta, yellow, black (except yellow on black)
- Choose light rather than dark colors
  - Preferably, black text on a light background in **most** of the poster

# Colors: Suggestions

- **Title Bar Color:** navy blue; forest green; olive green; burgundy; rust; plum (Your color should be dark enough to use white or cream as your main title text color.)
- **Background Color:** solid cream or beige; pale version of title bar color; any of the previous fading to white; white (Background colors should always be light enough to use black for your main text.)
- **Highlight boxes and Graph backgrounds:** pale version of title bar color; white; light cream or beige

<https://people.trentu.ca/~nicholasjones/Poster%20Design.pdf>

# Text Boxes and Spaces

- Effective posters are spacious and easy to follow
- Adequate clear space will direct attention to key elements
- If you put text in a colored box, make sure there is a text-free border of color around the text to increase readability
- Don't vary the width of text boxes
- Justify and set line spacing

# Graphics

- Aim for 40% graphic content, try to find ways to show visually what was done
- No photo, graphic or chart should be smaller than 5 x 7 inches (13 x 15 cm)
- Graphics should be attractive, clear and specific
- Crop and enlarge photographs to eliminate unnecessary information and focus attention on significant details
- Title or provide captions for your graphics
- Be aware that images from the world wide web, when printed large they often look soft and have large pixels



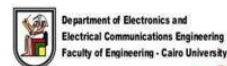
# Good Example



## VIDEO ENCRYPTION

submitted for MTH217 project

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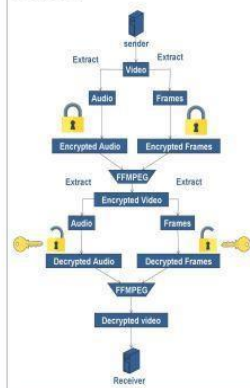
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| Structure  | Symmetric block cipher | Symmetric block cipher | Substitution Permutation Structure |
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| Security   | Proven inadequate      | Considered secure      |                                    |

### RC4 ALGORITHM

RC4 is a stream cipher algorithm, based on the usage of a random permutation. We use in our project RC4 algorithm Because:

1-It is very fast. 2-More secure.

**KSA**

```

for i = 0 to 255 do
    S[i] = i;
T[i] = K(i mod (K|))
j = 0
for i = 0 to 255 do
    j = (j + S[i] + T[i]) mod 256
    swap (S[i], S[j])
    
```

**PRGA**

```

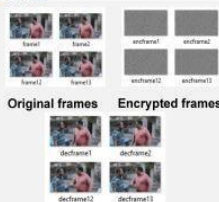
i = j = 0
While (more byte to encrypt)
    i = (i + 1) mod 256
    j = (j + S[i]) mod 256
    swap(S[i], S[j])
    k = (S[i] + S[j]) mod 256
    Ci = Mi XOR S[k]
    
```



### ANALYSIS & RESULTS

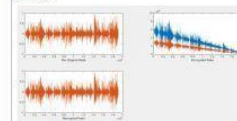
We simulated our project on MATLAB by inserting the video, MATLAB code encrypted the video images and the audio then merged them.

Frames:



Decrypted frames

Audio:



### APPLICATIONS

• Video Conferencing.

• Surveillance.

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### CONCLUSION & FUTURE WORKS

Video Encryption process improves a lot of applications which depend on transferring videos between different devices and provide them with a high level of security. Now, researches are working on a new types of data encryption algorithms like Quantum cryptography, Honey encryption, Functional encryption and Fully homomorphic encryption where data will be uploaded into a cloud. No one will be able to access it.



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### REFERENCES

- 1."Symmetric vs. Asymmetric Encryption - What are differences?", SSL2BUY Wiki - Get Solution for SSL Certificate Queries, 2017.
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# Bad Example

## PIGS IN SPACE: EFFECT OF ZERO GRAVITY AND AD LIBITUM FEEDING ON WEIGHT GAIN IN CAVIA PORCELLUS

Colin B. Purrington\*

6673 College Avenue, Swarthmore, PA 19081 USA

### ABSTRACT:

One ignored benefit of space travel is a potential alleviation of obesity, a chronic problem for a growing minority in many parts of the world. In theory, when an individual is in a condition of zero gravity, weight is minimized. Indeed, in space one could conceivably follow ad libitum feeding and never even gain an gram, and the only side effect would be the need to upgrade one's stretchy pants ("exercise pants"). But because many diet schemes start as very good theories only to be found to be rather harmful, we tested our predictions with a long-term experiment in a colony of Guinea pigs (*Cavia porcellus*) maintained on the International Space Station. Individuals were housed separately and given unlimited amounts of high-calorie food pellets. Fresh fruits and vegetables were not available in space so were not offered. Every 30 days, each Guinea pig was weighed. After 5 years, we found that individuals, on average, weighed nothing. In addition to weighing nothing, no weight appeared to be gained over the duration of the protocol. If space continues to be gravity-free, and we believe that assumption is sound, we believe that sending the overweight -- and those at risk for overweight -- to space would be a testing cure.

### INTRODUCTION:

The current obesity epidemic started in the early 1960s with the invention and proliferation of elastane and related stretchy fibers, which released wearers from the rigid constraints of clothes and permitted monthly weight gain without the need to buy new clothes. Indeed, exercise today for hundreds of million people involves only the aid of wearing stretchy pants in public, presumably because the constriction pressure forces fat molecules to adopt a more compact tertiary structure (Purvis 1985).

Luckily, at the same time that fabrics became stretchy, the race to the moon between the United States and Russia yielded a useful fact: gravity in outer space is minimal to nonexistent. When gravity is zero, objects cease to have weight. Indeed, early astronauts and cosmonauts had to secure themselves to their ships with seat belts and sticky boots. The potential application to weight loss was raised immediately, but at the time travel to space was prohibitively expensive and thus the issue was not seriously pursued. Now, however, multiple companies are developing cheap extra-orbital travel options for normal consumers, and potential travelers are also creating new ways to pay for products and services that they cannot actually afford. Together, these factors open the possibility that moving to space could cure overweight syndrome quickly and permanently for a large number of humans.

We studied this potential by following weight gain in Guinea pigs, known on Earth as fond of ad libitum feeding. Guinea pigs were long envisioned to be the "Guinea pigs" of space research, too, so they seemed like the obvious choice. Studies on humans are of course desirable, but we feel this current study will be critical in acquiring the attention of granting agencies.

### MATERIALS AND METHODS:

One hundred male and one hundred female Guinea pigs (*Cavia porcellus*) were transported to the International Space Laboratory in 2010. Each pig was housed separately and deprived of exercise wheels and fresh fruits and vegetables for 48 months. Each month, pigs were individually weighed by duct-taping them to an electronic balance sensitive to 0.0001 grams. Back on Earth, an identical cohort was similarly maintained and weighed. Data was analyzed by statistics.

### RESULTS:

Mean weight of pigs in space was  $0.0000 \pm 0.0002$  g. Some individuals weighed less than zero, some more, but these variations were due to reaction to the duct tape, we believe, which caused them to be alarmed push briefly against the force plate in the balance. Individuals on the Earth, the control cohort, gained about 540 g/month ( $p < 0.0002$ ). Males and females gained a similar amount of weight on Earth (no main effect of sex), and size at any point during the study was related to starting size (which was used as a covariate in the ANCOVA). Both Earth and space pigs developed substantial deposits (double chins) and were lethargic at the conclusion of the study.

### CONCLUSIONS:

Our view that weight and weight gain would be zero in space was confirmed. Although we have not replicated this experiment on larger animals or primates, we are confident that our result would be mirrored in other model organisms. We are currently in the process of obtaining necessary human trial permissions, and should have our planned experiment initiated within 30 years, pending expedited review by local and Federal IRBs.

### ACKNOWLEDGEMENTS:


I am grateful for generous support from the National Research Foundation, Black Hawk Owl Plans, and the High Fructose Sugar Association. Transport flights were funded by SPICE-EXTRA, the consortium of whose donors from intensely wealthy space-flight startups. I am also grateful for comments on early drafts by Mahana Athletic Club, Colopus Christi, USA. Finally, sincere thanks to the Coy Foundation for generously donating animal care after the conclusion of the study.

### LITERATURE CITED:

NASA. 1962. Project STS-XI: Guinea Pigs. Leaked Internal memo.

Bealut, S.R., D. D. Lukal, and N. M. Naumov. 2005. The Fetus Gained Exercise Like An Astronaut: Gravity Loading Is Necessary For The Physiological Development During Second Half Of Pregnancy. Medical Hypotheses. 6:220-229.

Kevin M. 1985. Elastane Pymnoses Acutely as Weight Gain in Case-control Study. Journal of Obesity. 2:23-48.



# Before Printing

- Take your time choosing, designing and drafting
- Print out poster as a pdf file before final printing to check layout and unwanted or missing parts
- Proofread a printed copy of size A3 before the final print
- Eliminate unnecessary detail
- Check spelling and grammar
- Check layout AGAIN before printing

# Common Mistakes, To Avoid

- Missing necessary items, e.g., references
- Over-crowded posters
- Alignment, Justification, line spacing
- Spelling mistakes, especially in the repeated keywords
- Low quality and resolution of images and charts
- Similarly, tables and equations when taken as snapshots, preferably rewrite
- .....

# Assess your poster: Attracting Your Target Audience

- If you encountered this poster at a poster session would you stop to look at it?
- Is the poster directed to the target audience?
- Is the title of the poster concise and does it stand out?
- Is the posters subject matter quickly discernible?
- Is the poster layout visually pleasing?

# Assess your poster: Delivering the Message

- If you stopped to look at this poster, would you read the text on it?
- Is the subject matter presented clearly and concisely?
- Does the information presented flow logically?
- Is the text readable in terms of linguistic difficulty/scientific language?
- Is the text legible in terms of font choice, size, color and spacing?
- Does the title bar include the presenters' names, and the identifier for the school or institution?

# Assess your poster: Creating Visual Impact

- Are the graphics large enough to be seen from a distance of  $> 2$  meters?
- Are the graphics attractive and relevant?
- Have legends or captions been used to guide the viewer?
- Does the poster have sufficient clear space?
- Are sections clearly defined with adequate space around them?
- Have items been aligned?



# Poster Presentation

- Editing, practicing, timing
- Evidence should be included in the poster, supportive simulations, upon request
- Handling audience questions
  - Be aware of questions types
  - Expect questions in advance
  - Prepare
  - Honesty
- Combating nervousness

# Comprehensive websites

<https://projects.ncsu.edu/project/posters/>

<https://colinpurrington.com/tips/poster-design>

# Questions?

**Thank you!**