

Preparing and Delivering Presentations

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Cmput 603

... including material from J Nelson Amaral, M desJardins and others...



*Making
IT
happen*

Computing Science



Outline

- Oral Presentations
 - Preparing slides
 - Delivering presentations
- Posters
 - Preparing material
 - Presenting posters

General Comments about presentations in general:

Move over...

Hard to read color?
Too small?

No bullets...
Bad line breaks

People are uni-processors: if their reading, their NOT listening. Therefore, it makes sense to write as LITTLE material on your slides as possible. Avoid complete sentences; use Bullets! Use LARGE fonts. Use pictures!

Give a simple examples FIRST, before giving the formal definitions, theorems, etc. Then perhaps use that example to "instantiate" the definitions, etc. (Don't worry: people typically do an amazingly great job of generalizing from such examples.) Help parse by splitting out phrases on separate lines.

Try to avoid technical terms, if at all possible. (Or at least give a simple example of the idea.)

Be sure to re-read slides and check!

Typos

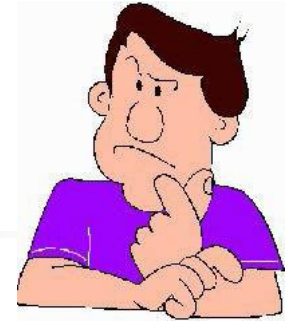
Why have this junk?? What does it mean?

4.1

... lighting? ... movement? ... monotone voice?



Presentations



- People are uni-processors:
 - If reading, NOT listening \Rightarrow minimize text!
 - *Avoid complete sentences*; use Bullets!
- Simple examples FIRST
 - ... before formal definitions, theorems, ...
 - use example to "instantiate" the definitions
- Easy to read *fast*:
 - Avoid technical terms
 - Lots of Pictures!
 - Separate lines for each idea
 - Use LARGE fonts... colors are fun ... so is animation
- Proof-read!!



Preparing Slides

Abuse of animation is a cardinal sin!

- Use the minimum amount of text necessary
 - Also have MINIMAL “stuff” in slide layout!
- Use examples
- Use a readable, simple, yet elegant format
- Use color to emphasize important points, but **avoid the excessive use of color**



How Much to Say?

- Think of **intended audience**
 - What do you want those people to know, when done?
 - Say **THAT!**
 - Say **ONLY THAT!**
 - Everything you say should relate to this msg(s)!
 - You tried a complicated, hard-to-explain alg ... that didn't work.
 - Why waste the audience time with 5pages of details?
- Superset of a good talk is *NOT* a better talk
 - Good movie == 3 good scenes; No bad ones!



Preparing Presentations: Timing

- Know how long you have
 - How long is the talk? Are questions included?
 - A good heuristic is 2-3 minutes per slide
 - Maybe... depends on your own pacing...
 - Can *never* say *everything* about a topic, so don't worry about skipping some things!
 - If inexperienced, practice your timing:
 - A couple of times on your own to get the general flow
 - At least one dry run to work out the kinks
 - A run-through on your own the night before the talk



Preparing Presentations: Audience

- Know your audience!
 - If a “general audience”:
Give the necessary background
 - If talking to researchers in your field:
Don't waste time on basics
- Imagine you didn't know this material
 - What would YOU need to get it?
- Explain each new concept clearly
 - Use example! ... pictures!
- Emphasize
 - *what you've done*
 - *why they should care!*



Preparing Presentations: Content

- Know what you want to say
 - Do NOT just giving a project summary
 - ...not interesting to most people
 - Give enough detail to express your interesting ideas
 - and to show that you've actually solved the problem but not so much that you lose your audience
 - They want to hear
 - *what you did that was cool* and
 - *why they should care*
 - They should hear these points
 - at the beginning of the talk
 - over the course of the talk, and
 - at the end of the talk
 - If intrigued, they'll ask questions or read your paper



Preparing Presentations: Help Viewer

- Pictures better than words
- Use line breaks to help parse
- Use colors consistently
 - Eg, write everything that the user types, in blue.
- A full slide of text can be overwhelming!
 - Use animation to present information incrementally.
- Notation:
 - Do not use the same variable for many purposes... not even if in different fonts!
 - Avoid "1" vs "l" "0" vs "O"



Preparing Presentations: Story

- Tell a story!!
 - Goal is for THEM to understand!
 - Don't give deep, complicated proofs
- **Re-read slides**
 - make sure they are understandable
 - make sure they "flow"
- **Be cute...** but not too cute...
 - Never have off-color comments
- Be sure **YOU understand the material!**
 - ... even if someone else's slides!
 - Heuristic:
 - Think through to one level more depth than slides...

Preparing Presentations: Overhead

- Roadmap slides
 - if >15 minutes
 - helps “wake people up”
- Organization
 - *Tell'em what you're going to tell'em*
 - ≈1-2 minutes
 - *Tell'em*
 - *Tell'em what you told'em*
 - ≈1 slide (1 minute)
- Manage time
 - Have “accordion slides”
 - If necessary, skip material
 - Plan for this...
- People best remember the *LAST* thing you say
 - ... Contributions, Future Work
 - ... Future Work, Contributions

Outline

- Grad School overview
- How to find Advisor
- Networking
- Publications
- Presentations

Sept 2008 12





Preparing Presentations: Details

- Define terms
 - Before use!
 - Use in example
- Label axes of graphs
 - But don't include "Fig 1" or "Table 2"
- Don't give complicated proofs
 - Perhaps just sketch high-points

Preparing Presentations: Extra Slides



- If you
 - anticipate some questions
 - have tangentially related ideashave AUXILLIARY slides,
at end of presentation!
- Use to answer questions
- Use for later talk, when have MORE time



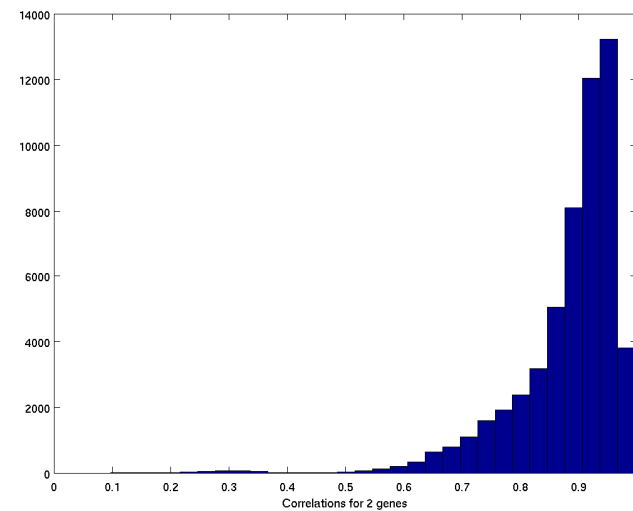
Preparing Presentations: Size

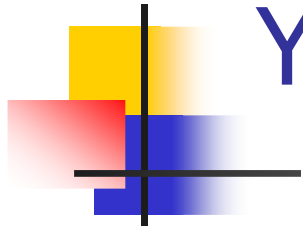
- YOU control the space in your slides...
 - Use it effectively!

- Make figures **LARGE!**

Yadda Yadda Yadda

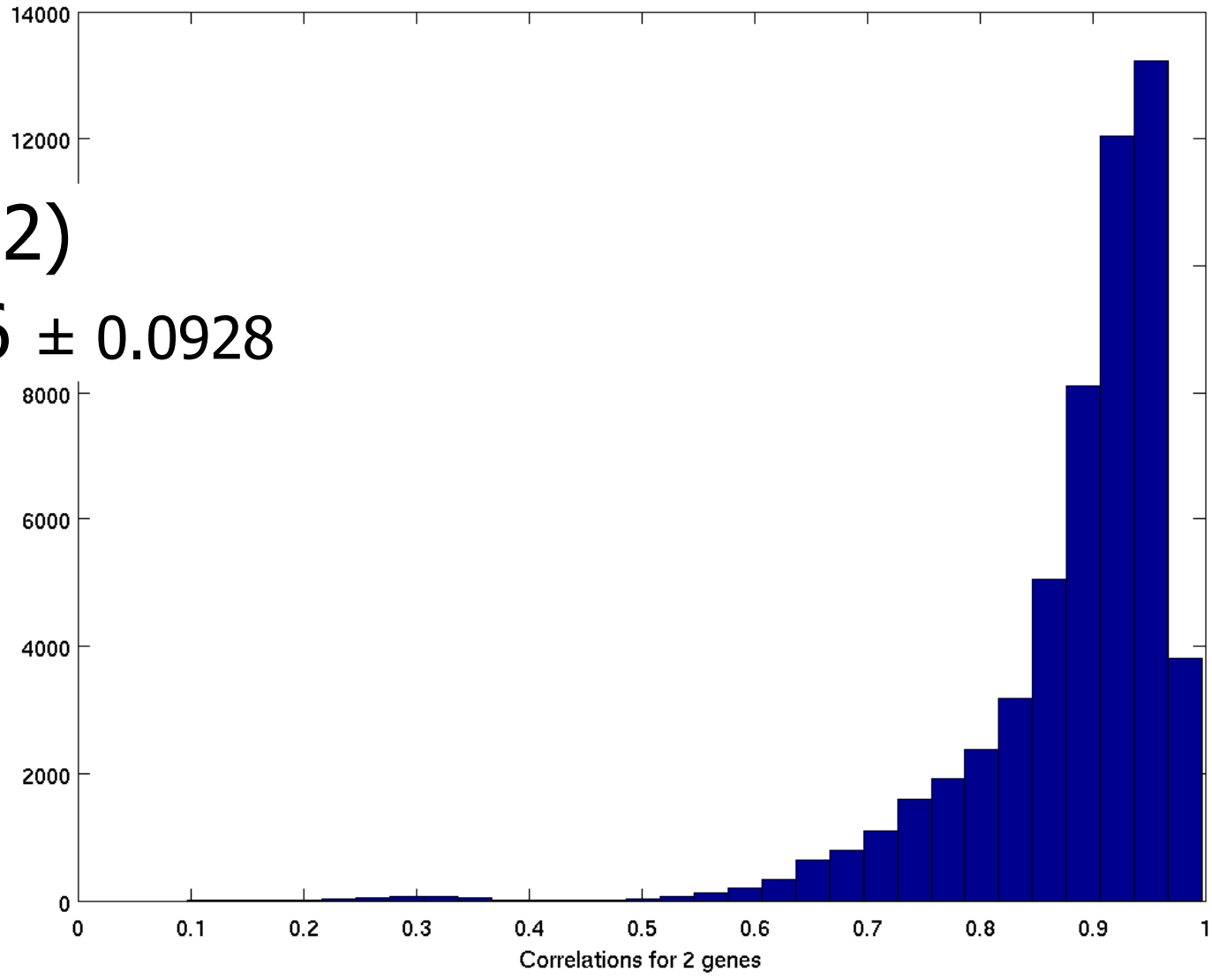
- Blahs (332)
- P: 0.8836 ± 0.0928





Yadda Yadda Yadda

- Blahs (332)
- P: 0.8836 ± 0.0928





Preparing Presentations: Font

- $=>$ VS \Rightarrow
- $a = \langle 2,3 \rangle$ VS $a = \langle 2,3 \rangle$
- $*$ VS \times
- ε VS \in
- $!=$ VS \neq
- \mathbb{R} VS \mathfrak{R}
- $\{ \dots \}$ for set; $[\dots]$ for tuple; ...
- Use spacing to help viewer

$A=f(b(x),g(y))$ forall x,y

$A = f(b(x), g(y))$ forall x,y

Practice, Practice, Practice

- **Practice!**

Give talk to

- professional colleagues (students, advisor, collaborators)
- friends, or spouse, or ...
- Slide numbers (at least during practice)
- Never give a talk for the first time 😊



Just Before Presentation

- You are in charge!
 - Engineer your room
 - lighting
 - decide where to stand
 - move obstacles away
 - ...
 - Arrive early!

- Details...
 - Plug in laptop
 - Turn off cell phone, messaging, ...
 - ...





Other Advice: during presentation

- Don't forget:
 - You are the EXPERT on this topic ...
 - You know it better than the audience!Relax and enjoy!
- Interact with the audience!
 - Make eye contact
 - See if audience is tracking
 - Ask questions!
 - *Don't just read your slides!*
- Move!
 - Don't fidget
 - You can (should!) move around
 - Point to PRESENTATION, not to your laptop!
 - Do not just sit ...
- Adjust voice for emphasis ...



If you make a mistake ...

- Don't fret, pout, get upset ...
- If not critical, just on
 - Perhaps mention this issue at END
 - Or not...
- If critical...
 - just go back to problem and fix it!
 - fix it when necessary



Series of Presentations

- When giving a SEQUENCE of related presentations
 - Eg, a course, or seminar series, or ...
- Have “landmark slides” covering ENTIRE series
- Take time at start of each lecture to
 - Set the context (wrt global “landmark slides”)
 - REVIEW previous material
- At end of each lecture:
 - summarize current situation
 - point to future material

Use ideas from David Cook's Presentation!



- His focus: “teaching students”, but same ideas apply to
 - general audiences... fellow researchers
- Lecture is for the **AUDIENCE**
 - Not for you!
- Show that **YOU find it exciting**
 - Explain why it is useful
 - Make it accessible
- Try to **BOND with the Audience**
 - start with Story, ...
- **Reward the questioner**
 - ... even if the question is ...sub-optimal ...



Some Useful Resources

- Writing:

- Lynn DuPre, *Bugs in Writing*
- Strunk & White, *Elements of Style*

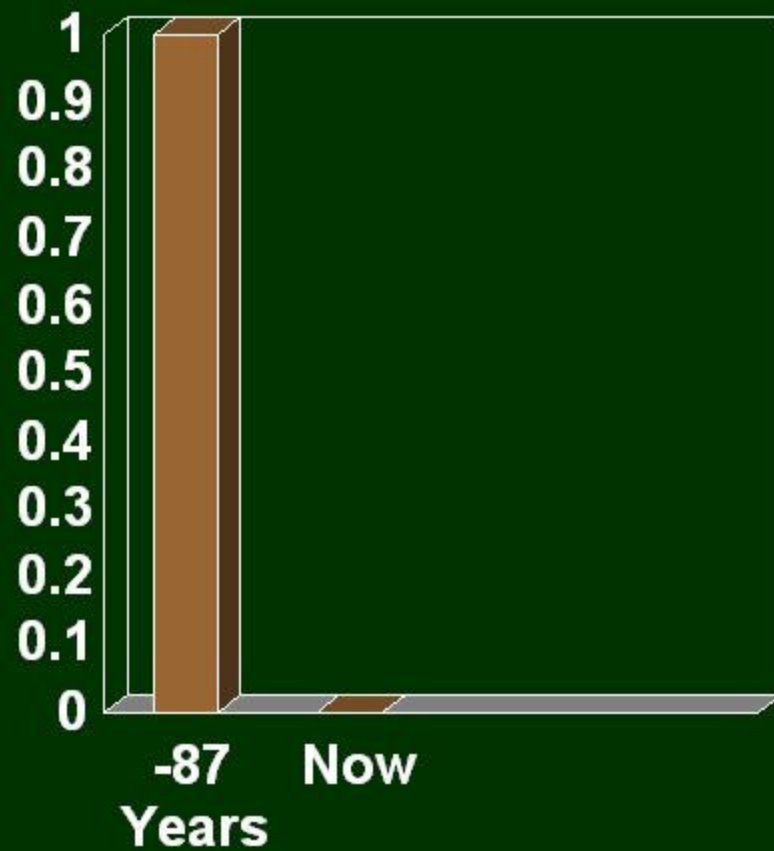
- Giving talks:

- Mark Hill, "Oral presentation advice"
- Patrick Winston, "Some lecturing heuristics"
- Simon L. Peyton Jones, et al., "How to give a good research talk"
- Dave Patterson, "How to have a bad career in research/academia"

- Fun: Gettysburg Powerpoint Presentation:
<http://norvig.com/Gettysburg/>

Organizational Overview

11/19/1863



 **New Nation**

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Outline

- Oral Presentations
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Poster: Form

- Poster \approx Presentation (ppt), ... not essay
... easy on the eyes...
with
 - pictures
 - few words (lots of white space)
 - large letters

- Stand 2-3meters from poster.
 - Should get most of the ideas
 - ... based only on the figures,
w/out the "small print"



Think of Poster \approx Presentation...

- Use line breaks to help readers parse sentences
 - Avoid "Figure 1" or "Table 3"
 - unless you *need* to refer to a figure/table
 - Typically NOT needed – just use proximity, or arrows
 - Use just PHRASES within BULLETS
 - not complete sentences
 - Extra words are problematic, as ...
 - If people are reading, they aren't listening!
 - Many words make a poster look crowded, ...
like it will be hard to understand.
- ⇒ potential viewers will go to another poster ...

Which would you rather see?

Targeted profiling and analysis of urine metabolome to identify biomarkers associated with cancer cachexia

Background

Cancer cachexia is a complex metabolic syndrome characterized by significant weight loss and skeletal muscle depletion. It is a leading cause of treatment-related mortality, affecting ~50% of all cancer patients. Despite decades of clinical investigations, there has been no clear consensus on the etiology or treatment of the syndrome. To date, the bulk of the studies on cachexia-related metabolic alterations examined one or only a few compounds based mainly on multiple labeling techniques. Recent advances in metabolomics techniques offer new opportunities to study comprehensively the metabolic abnormalities of the complex syndrome.

The primary purpose of this project is to assess the potential of urine metabolomics for the study of cancer cachexia. Our goal is to: 1) identify important urinary metabolites associated with cancer cachexia, and 2) to assess their utility with regard to understanding disease mechanisms, as well as diagnostic purposes.

Methods

Urine from overnight fast and patient monitoring in total of 74 cancer patients with either lung or colorectal cancer were involved in this study. Urine samples were collected using computerized tomographic (CT) images at fixed lumbar vertebrae. The TMS change in a three-month period (TMS) normalized by patient weight was used as indicators of development of cachexia.

MRM spectroscopy and targeted profiling MRM samples were prepared by combining 500 μ l of urine, 70 μ l of D₂O, and 130 μ l of a mixture containing 10 mM sodium phosphate, 2 mM NH₄Cl, 5.0 mM imidazole, and 0.1% NaCl. The samples were then transferred to a standard 6 mm NMR tube. MRM spectra were acquired at 500 MHz using a cold probe. ChemoSight MRM Suite was used to perform spectra parsing, baseline correction, metabolite identification and quantification.

Biomarker identification and classification A variety of statistical and machine learning methods including significance analysis of microarray (SAM), random forests (RF) and partial least squares (PLS) were explored for feature selection to identify significant metabolites associated with cachexia. To evaluate the diagnostic utility of the selected compounds, several classification methods including support vector machine (SVM), naive Bayesian classification and support vector machine (SVM) were applied. Results are summarized in the associated caption and table below.

Results

Figure 1. Muscle mass change in the three quarters of the 74 cancer patients. Patients with muscle mass loss greater than 1.5% were labeled as cachectic (C), patients with stable or gain muscle mass were labeled as non-cachectic (N), and patients with slight muscle mass loss (0.1-1.5%) were classified to reduce investigators bias.

Figure 2. SAM analysis to identify cachexia-associated metabolites. The SAM plot shows the observed relative difference versus the expected relative difference. The dashed diagonal lines indicate a 2.5% and the horizontal lines represent the cutoff threshold with a 0.5% false discovery rate (FDR). The selected compounds obtained from SAM are shown in Figure 3 based on their p-values.

Figure 3. PLS-DA analysis to identify cachexia-associated metabolites. The score plot shows the separation between the first two components. The top 10 selected metabolites were shown in Table 1 based on the VIP scores.

Figure 4. Box-whisker plots of the identified compounds in different categories. * Cachectic (C), Non-cachectic (N). * After the log₁₀ transformation of some compounds are caused by missing value replacement after log₁₀ transformation.

Table 1. Classification performance of RF and SVM based on leave-one-out cross-validation.

Method	Accuracy (%)	SP	SN
Random Forest	82	92	72
SVM	64	87	39

SP: Sensitivity, SN: Specificity, T: Cachectic, N: Cachectic

Figure 5. Predictions of ASM using urinary metabolite concentrations. The correlation between the observed and predicted ASM is 0.78 based on leave-one-out cross-validation. The red line is the best fit line.

CONCLUSIONS

Machine learning metabolomics offers a promising way for the study of metabolic abnormalities associated with cancer cachexia. Many algorithms developed in the past decades for genomics data analysis can be readily used for analyzing the data obtained from targeted metabolomics. In this study, we identified 10 important metabolites associated with cancer cachexia. These metabolites are involved in various metabolic pathways, including glycolysis, gluconeogenesis, and amino acid metabolism. The identified metabolites are involved in energy expenditure, muscle protein synthesis, and muscle repair. The identified metabolites are involved in energy expenditure, muscle protein synthesis, and muscle repair. The identified metabolites are involved in energy expenditure, muscle protein synthesis, and muscle repair.

Acknowledgements

Alberta Ingenuity Centre for Machine Learning, HMP, NSERC CRNSG, Alberta Ingenuity Centre for Machine Learning, University of Alberta

Machine Learning Analysis of Cancer Cachexia

GenomeCanada
GenomeAlberta

hmp <http://www.hmdb.ca>

ALBERTA INGENUITY CENTRE FOR MACHINE LEARNING

UNIVERSITY OF ALBERTA

Introduction

Cancer cachexia is a significant and rapid loss of adipose and skeletal muscle mass. Cachexia is usually quite difficult to detect and quantify, and weight loss is often not a symptom of cachexia until the final phase of the disease. Cachexia results from altered muscle mass and energy expenditure and loss of skeletal muscle and adipose tissue. The development of a good, non-invasive blood or urine test to detect the earliest stages of cachexia would have significant implications for treating this metabolic disorder. Such a test could potentially improve patient quality of life and assess longer term survival. In an effort to develop such a test we have conducted a metabolomics study on urine samples of 74 cancer patients. Metabolites in these samples were quantified using MRM. As shown here, the application of advanced machine learning techniques allows the detection of several characteristic metabolic profiles that are strongly indicative of the degree of cachexia as measured by conventional CT methods/diagnosis.

Data Set

Procedure:

- Collect urine samples from 74 cancer patients
- 11 MRM spectra were acquired using a 600 MHz MRM spectrometer equipped with cold probe
- Urinary metabolites were identified and quantified using ChemoSight MRM Suite software
- Estimated muscle mass using Computed Tomographic (CT) scan

Two Analyses:

Task A: Classification of Cachectic Status

- Classified each patient as either "Cachectic" or "Not Cachectic" based on their urine metabolite profiles

Task B: Regression of Apparent Skeletal Muscle Mass

- Used the identified metabolites to predict skeletal muscle mass based on their urine metabolite profiles

Data Processing

Task A: Classification Analysis (% Muscle Loss)

- Each sample is labeled as "Cachectic" or "Not Cachectic" if muscle mass change is below -0.5% or above 0.5%, respectively (remaining samples are removed due to inherent ambiguity)

Metabolite concentrations:

- Metabolites with over 1/2 missing values or patients with 1/2 missing values were discarded
- Replace missing values with 0.5 μ M (the machine detection limit)
- Normalize each concentration value by dividing by the patient's creatinine concentration
- Resulting metabolite concentrations generally follow an exponential distribution. These are log-transformed to produce a more Normal distribution

Results

Task A: Classification of Cachectic Status

- Leave One Out Cross-validation
- Random Forest (RF): 82% accuracy
- Naive Bayes (NB): 64% accuracy

4PLS-DA

Summary of Important Metabolites

Metabolite	Chemical Name	Formula	Mass	Charge	Retention Time
1	Glucose	C ₆ H ₁₂ O ₆	180	0	1.2
2	Fructose	C ₆ H ₁₂ O ₆	180	0	1.5
3	Galactose	C ₆ H ₁₂ O ₆	180	0	1.8
4	Mannose	C ₆ H ₁₂ O ₆	180	0	2.1
5	Sucrose	C ₁₂ H ₂₂ O ₁₁	342	0	2.4
6	Maltose	C ₁₂ H ₂₂ O ₁₁	342	0	2.7
7	Glucose-6-phosphate	C ₆ H ₁₂ O ₆ P ₃	260	-3	3.0
8	Fructose-6-phosphate	C ₆ H ₁₂ O ₆ P ₃	260	-3	3.3
9	Galactose-6-phosphate	C ₆ H ₁₂ O ₆ P ₃	260	-3	3.6
10	Mannose-6-phosphate	C ₆ H ₁₂ O ₆ P ₃	260	-3	3.9

Task B: Regression Analysis (ASM)

- Regression is performed on the raw ASM data and Metabolite data
- Un-normalized metabolite concentrations are used on data from novel patients
- Individual metabolite concentrations that are not confidently assigned using the ChemoSight MRM Suite are ignored
- Learn classifier from (labeled) training data, to use on data from novel patients
- Important metabolites identified using Support Vector Machine (SVM) weights

Discussion

- The linear classifiers used implicitly assumes independence between metabolites. This works well because correlations between metabolites are generally low.
- Combining results from several machine learning approaches identifies many urinary metabolites associated with cancer cachexia
- Achieved over 80% accuracy using these metabolites (random forest or naive Bayesian network)
- These identified metabolites are involved in a wide variety of metabolic pathways:
 - gluconeogenesis
 - methane metabolism
 - glycine biosynthesis, and others
- Affected pathways reflect the overall deregulation of metabolic processes in cancer cachexia
- Cachexia refers to not only a tissue loss but a rapid rate of tissue loss. Further studies could include the rate at which muscle is lost, which could be an important factor in metabolic analysis

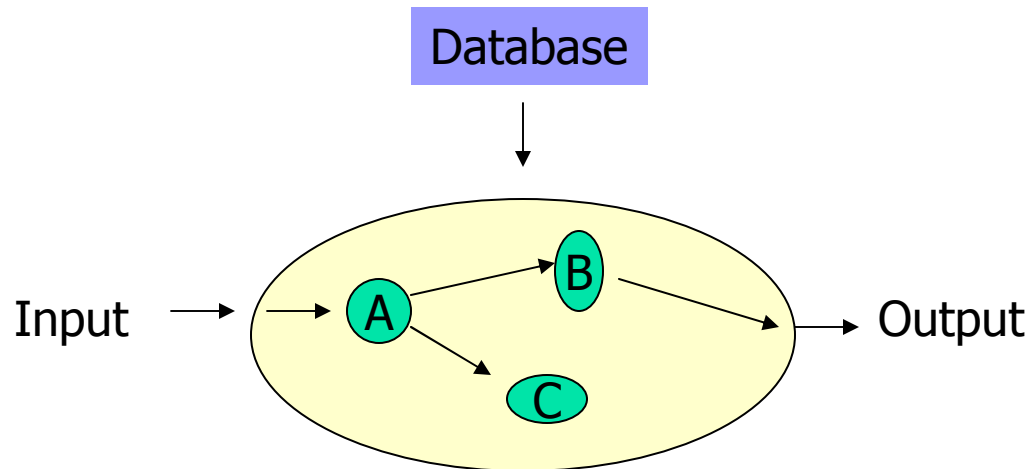


Effective Poster: Contents

- **Re-read it**, to make sure it is understandable
- Include
 - **BIG** idea? ... simple to understand, quickly!
 - Use examples – in pictures!
Better: **one** example,
 - many times to illustrate the basic ideas
- Framework
 - **Foundations** – what problem are you trying to solve?
Why should anyone **care**, if you succeed?
 - **Your approach** (high level)
 - **Your results** – theoretical, empirical, whatever...

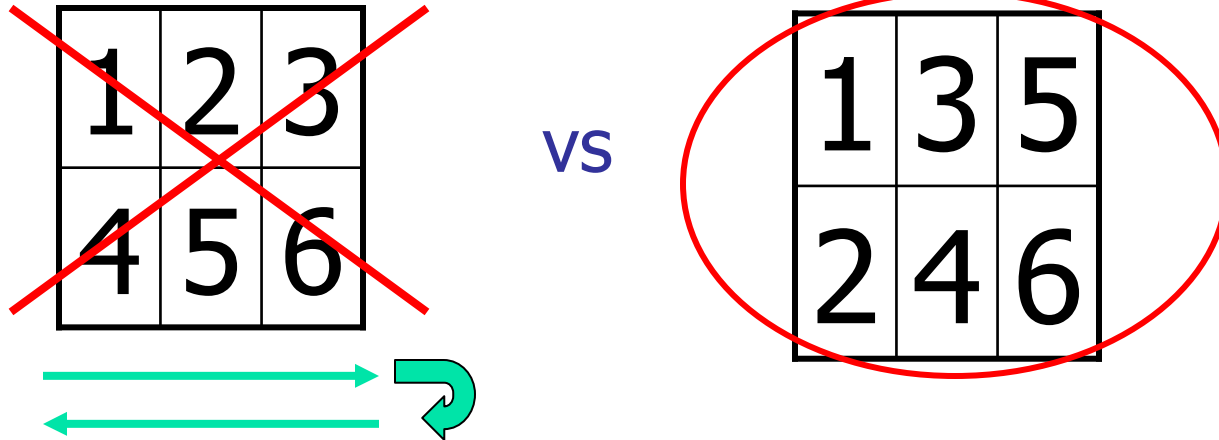
Use Diagrams !

- Many Computing Science ideas correspond to some *procedure*
 - Perhaps with subroutines...



- Distinguish Data from Process
- Be sure to include "implicit inputs"
 - Eg database

Poster Layout ?



- Left-to-right: reader will slide left-to-right, then jump back to the left margin, then slide to the right, then ...
- Especially problematic if many viewers
 - "sliding viewers" will distract others!





Effective Poster: Presentation

- **RIGHT**-handed \Rightarrow poster on your **RIGHT** side
 - so you can point to material, while facing audience
- As you progress over the poster, you will block some viewers
 - unavoidable... just try to minimize it.
- Devote your attention to current viewer(s)
 - If others arrive during presentation, interrupt to say
"I will restart in *X* minutes"



Don't forget ...

- Acknowledge your funders!
- How to learn more...
 - get databases? ... code?
 - URL? ... email address?
 - Bring/distribute business cards (with URL)!
- If general poster
 - NOT in a single specific venue
 - give citations to where these results appeared



Summary

- Use ideas for Good Papers...
- Preparation
 - Think of what you want audience to know
 - Include (only) that!
 - Large print, easy to follow...
 - Be concise, focused
- Delivery
 - Engineer your environment to facilitate communication
 - Relax, and Enjoy!