

Developing and Delivering Scientific Presentations – Some Hints

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Digitalisation and the Rebound Effect seminar, 24 September 2020

Good seminar presentations – why should we care?

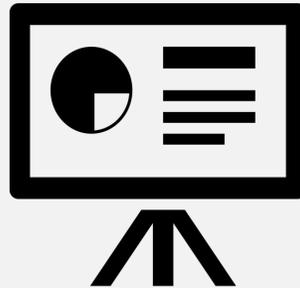
- **Presentation skills** are required in **professional life**
 - present yourself, your research, your company, an idea, a product...
 - you will often (implicitly) be evaluated based on a presentation
- In the context of this seminar, learn how to present **scientific content**
- Also learn
 - how to digest **different knowledge** sources and make a consistent picture out of it
 - to present the result in a **structured** way, adequate for the audience
 - to make and defend **your point** in front of a group



Developing and delivering scientific presentations



1. Choosing the content



2. Preparing the slides



3. Delivering the talk

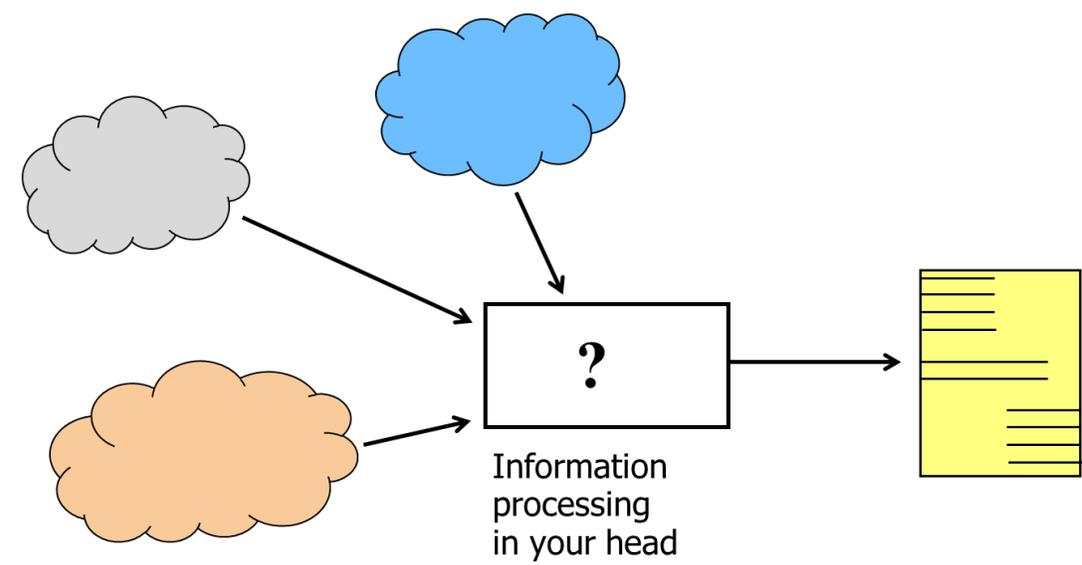


1. Choosing the content



Intellectual challenge – choosing and organising the content

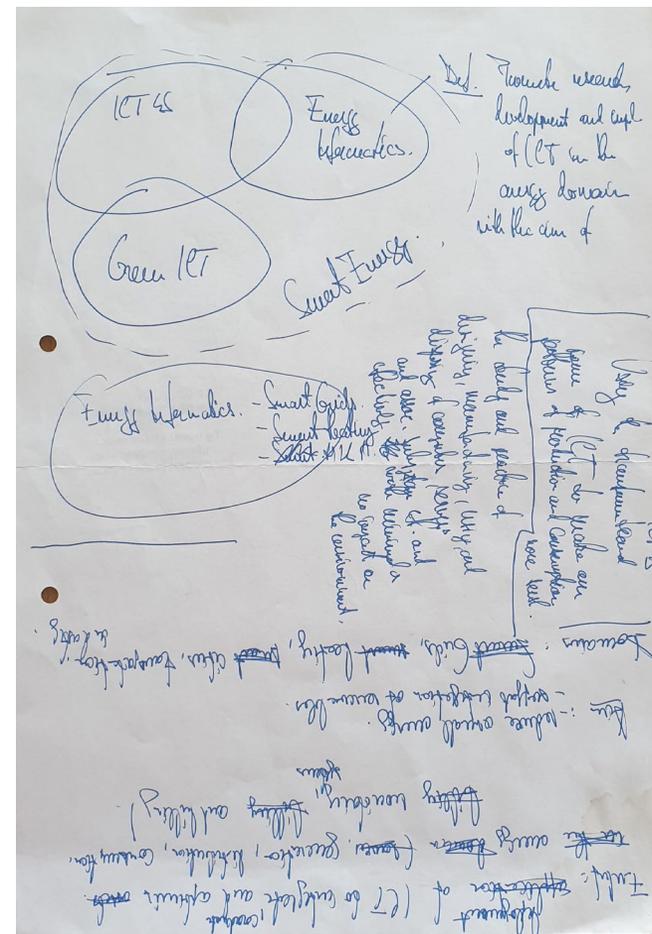
- Try to convince, not to persuade
- Read and use the **literature** in a **critical** way
 - authors are *almost* always right
- Read and use **different sources**
 - typically, scientific articles are more reliable than information on the Web
- Ponder about what you want to say
 - ideally **top-down**
 - not at the computer, but a **sheet of paper**





While deciding upon the content, think about following questions

- For **whom** is the presentation?
 - target audience
 - its expectations and **prior knowledge**
- What is the **main message(s)** you want to convey?
- What is the **purpose** of your presentation?
 - Teach, inspire, sell, convince,... ?
- (in the context of this seminar, these answers are easier than in general)

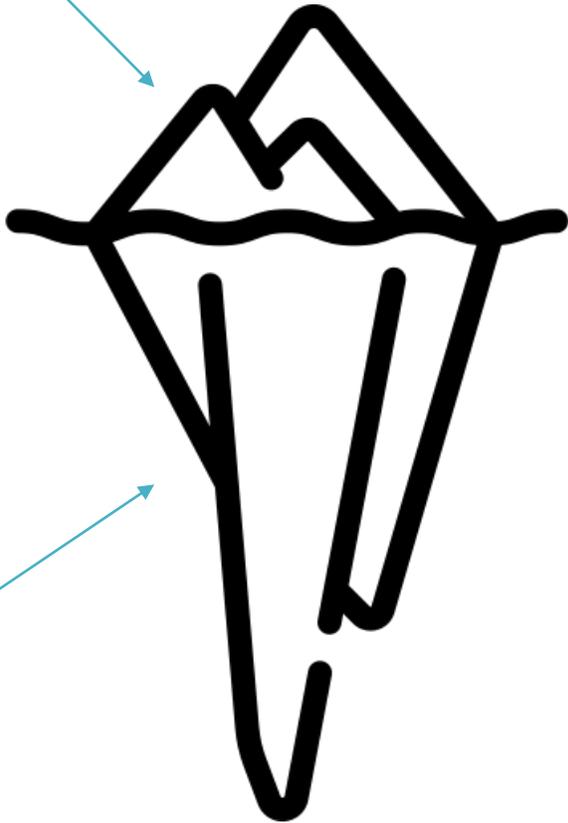


me preparing a presentation for a specific target audience



You should know so much more than what you present

what you present



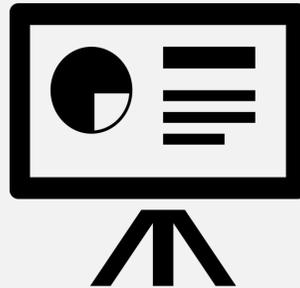
what you know

- Deep understanding of the topic required
- But also understand what you do not understand (or is generally not understood)
 - and ideally address it openly
 - it is **not a sales pitch!**
(at least not generally and certainly not entirely)
- Also know where the literature disagrees (often in our seminar: categorises differently)
 - explain it
 - if necessary, take a (well argued for) position
- Does not work last-minute
(sorry, fellow procrastinators!)

Developing and delivering scientific presentations



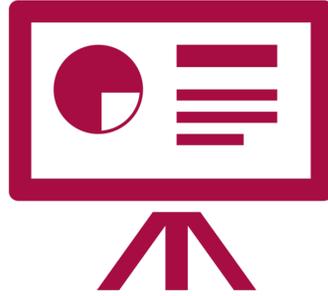
1. Choosing the content



2. Preparing the slides



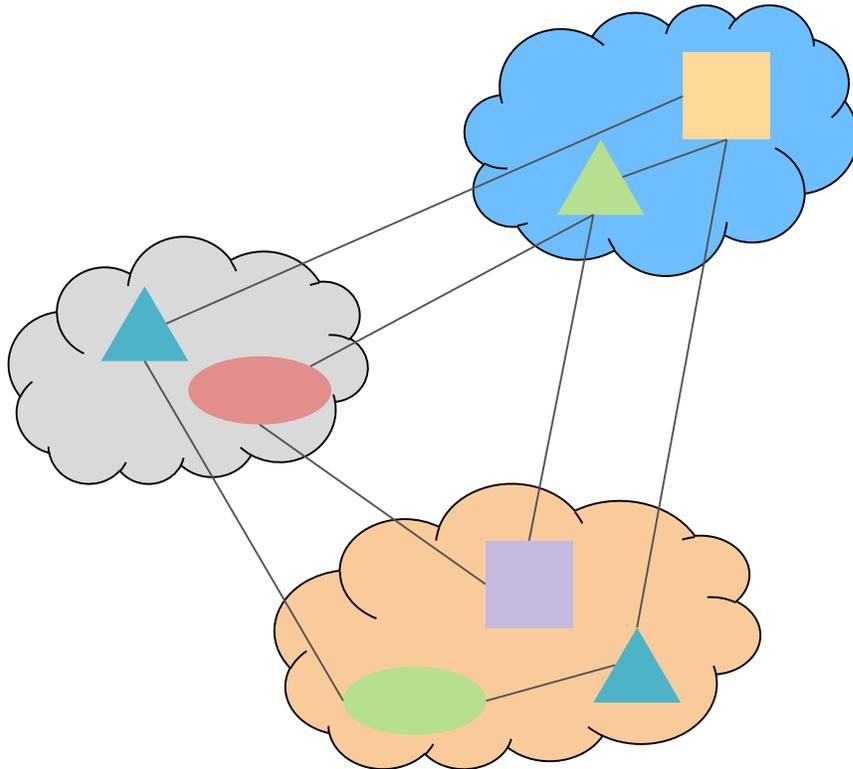
3. Delivering the talk



2. Preparing the slides

Frustrating linearity of a presentation vs. complexity of reality

Reality is complex and interconnected



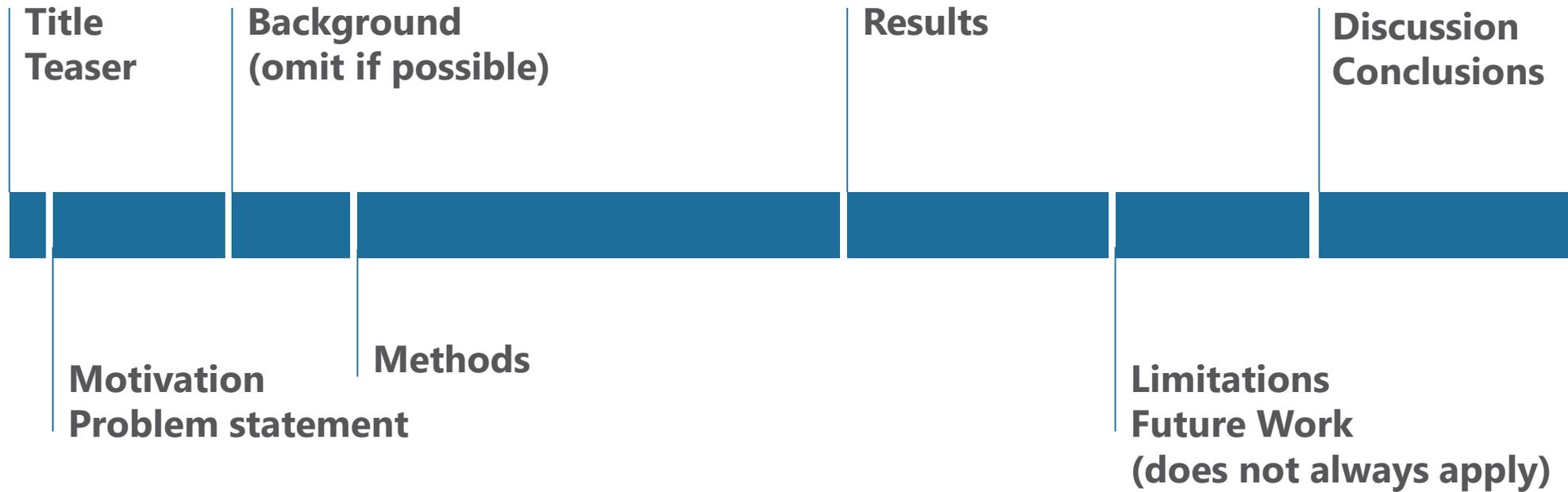
A presentation is linear

- Some tools might help to alleviate this a little
 - e.g. Prezi
- Remains, however, a fundamental limitation of presentations
- ... and also of any book, report, etc
 - there, however, less critical
 - reader may go back and reread, stop and ponder, take a pen and follow the thoughts, ...





Typical structure of an academic presentation

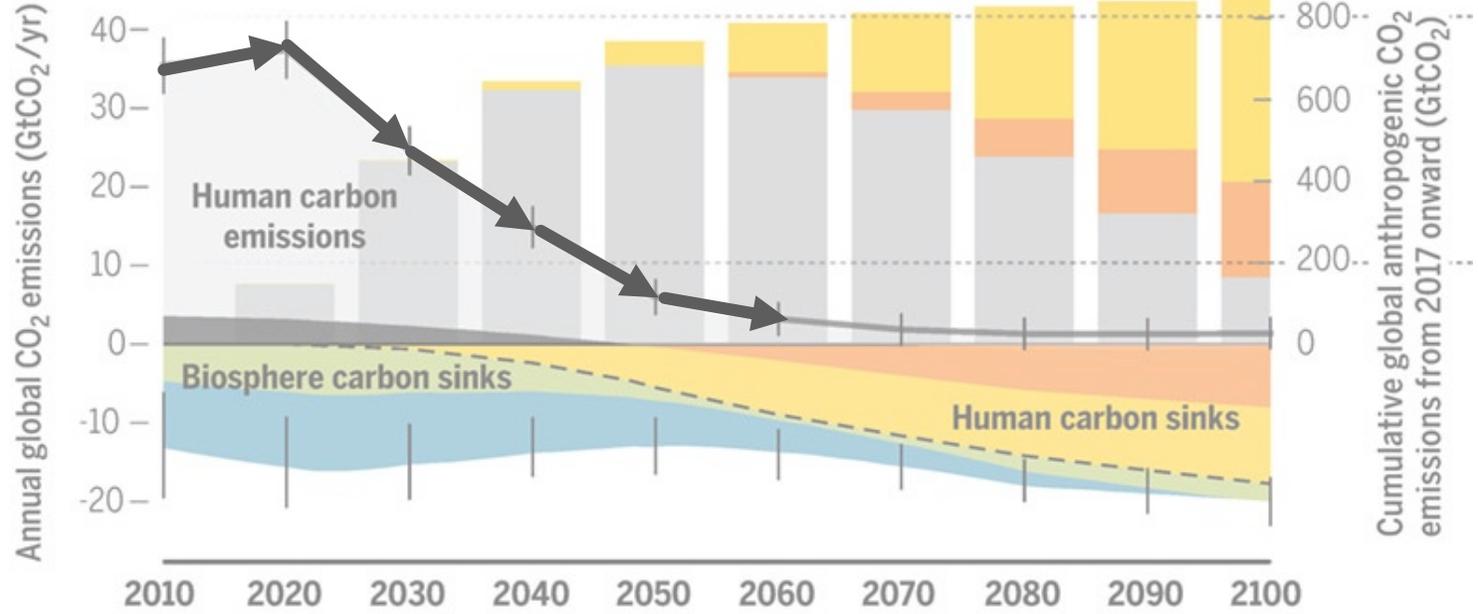


Teaser example from my intro to the seminar last week

Context of the seminar

Contribute to **understanding the complex relation between** the ongoing **digitalisation and societal energy consumption**, given the urgency of the climate crisis.

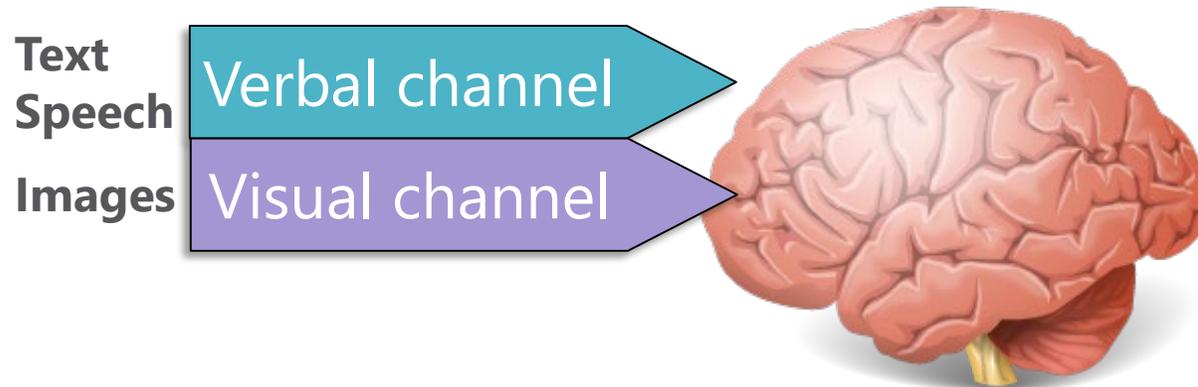
Decarbonization pathway consistent with the Paris agreement



- We need to halve our emissions every decade
 - and be basically emissions-free by 2050-2060
- Digitalisation is a blanket technology protruding all aspects of society and economy
 - can have profound impact, in both directions

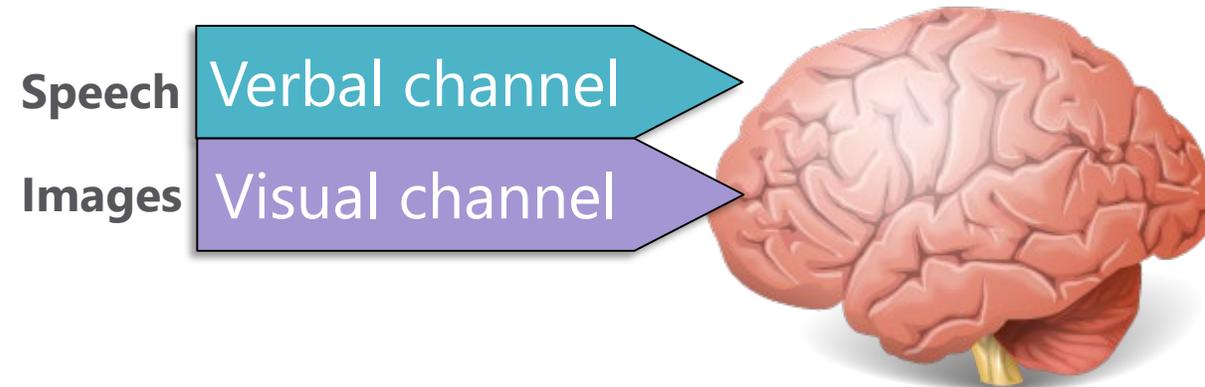
Text versus images on slides

Often occurring mistake: lots of text



- You cannot read and listen at the same time
 - text on slides and referent's voice competing for the verbal channel

Ideally



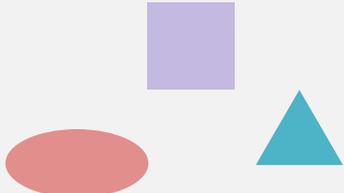
- Slides with little text
 - leaving the verbal channel free for your talking

Handling the medium

- Lorem ipsum dolor sit amet
- consectetur adipiscing elit
- ed do eiusmod tempor incididunt
- labore et dolore magna aliqua
- ut enim ad minim veniam
- quis nostrud exercitation ullamco

'Teleprompter'

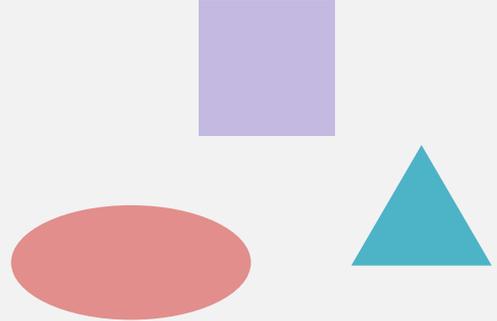
really bad



- labore et dolore magna aliqua
- ut enim ad minim veniam
- quis nostrud exercitation ullamco

'Slideument'

(better)



Presentation

(ideal, but not always possible)



Example slide of mine
Almost no text, lots of talk

We consider two heating strategies

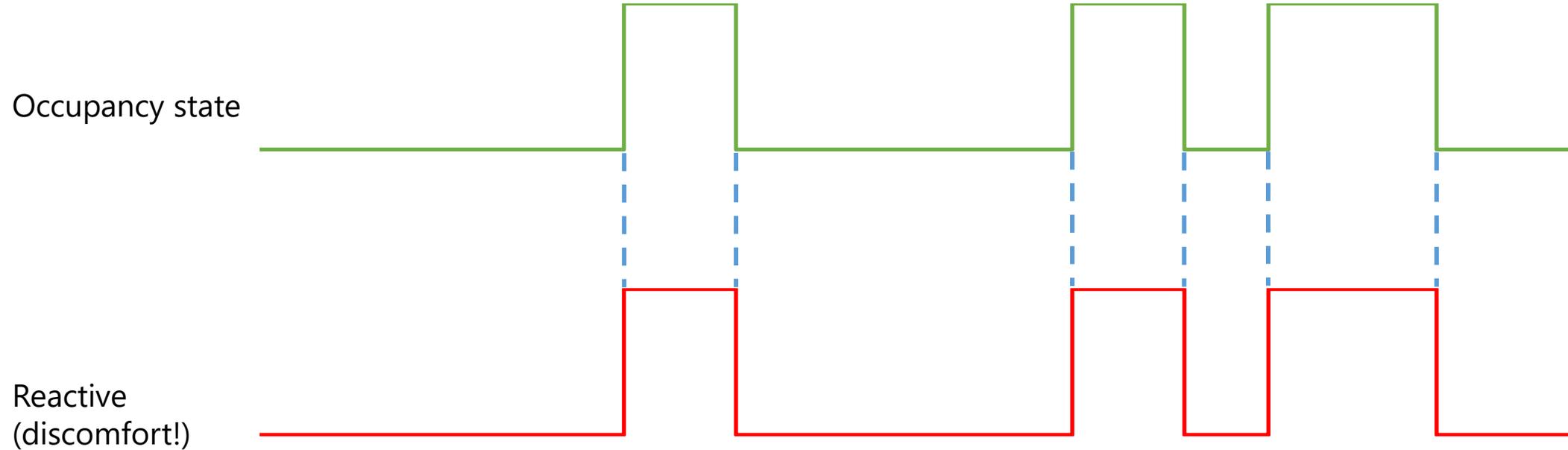
Occupancy state



Example slide of mine
Almost no text, lots of talk

We consider two heating strategies

- Reactive: Re-heat (if necessary) as soon as occupancy is detected



Example slide of mine
Almost no text, lots of talk

We consider two heating strategies

- Reactive: Re-heat (if necessary) as soon as occupancy is detected
- Oracle: Heat taking future occupancy into account

Occupancy state



Reactive
(discomfort!)



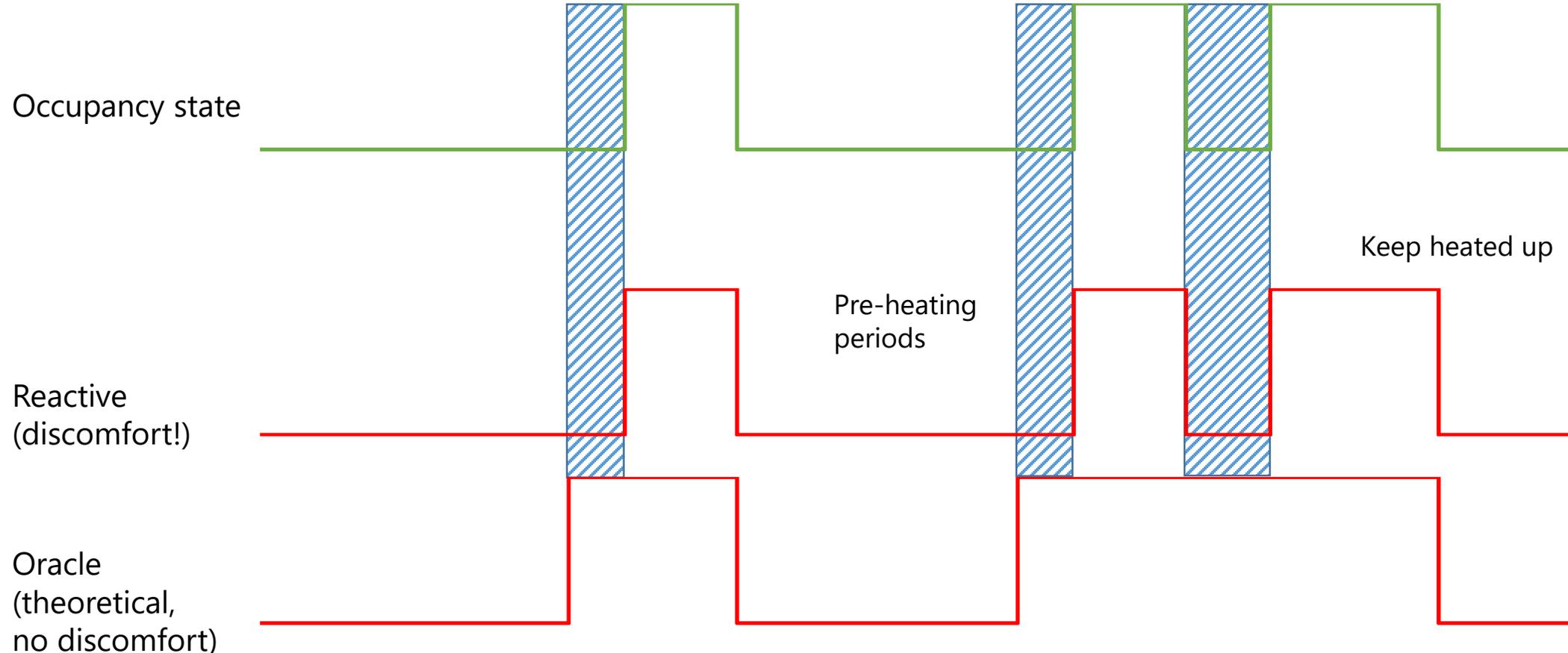
Oracle
(theoretical,
no discomfort)



Example slide of mine
Almost no text, lots of talk

We consider two heating strategies

- Reactive: Re-heat (if necessary) as soon as occupancy is detected
- Oracle: Heat taking future occupancy into account

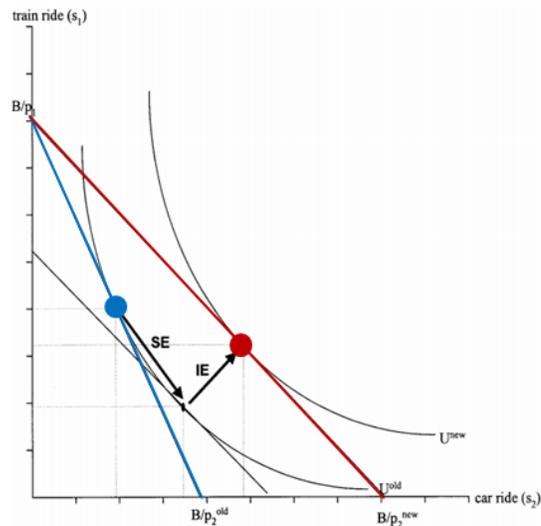


Then what about this example slide of mine from a lecture?

(seems to contradict all we've discussed so far)

Indirect rebound: two out of many mechanisms

Income and substitution effect



- In the beginning, the budget line allows
 - B/p_1 train rides,
 - B/p_{2_old} car rides,
 - or combinations along the blue budget line
- The maximum utility is at the blue dot, with around 4 train and 2 car rides
- In an (extreme) example with car rides becoming twice as efficient, the new red budget line
 - allows B/p_{2_new} car rides (double as many)
 - still B/p_1 train rides
- Achievable utility grows to the red dot, with around 3 train and 5 car rides
 - **Income Effect (IE):** the growth in achievable utility
 - **Substitution Effect (SE):** the partial substitution of relatively cheaper car rides for now relatively more expensive train rides

(Binswanger 2001): Technological progress and sustainable development: what about the rebound effect?, *Ecological Economics* 36.

44

- Different context
 - lecture slides also serve for later reference
 - e.g., for exam preparation
- Are browsed through at an entirely different pace
 - for such a slide, several minutes
 - with numerous animations
 - and spontaneous audience interaction
- But even for a lecture slide, I dislike it 😊
- Unlike lecture slides, good presentation slides are **not** self-contained



Consistency of style

- Either you start all first-level bullets with a capital letter
 - and perhaps all second-level bullets with lowercase
- or you might use all lowercase
 - Or even all bullet levels with uppercase
 - but it should be consistent throughout your presentation
- Either all British English (BE)
 - digitalisation, analysing, modelling, colour
- Or all American English (AE)
 - digitalization, analyzing, modeling, color
- You may prefer to finish bullets with a dot.
- Or you might like it more without
- Gender neutrality in English
 - instead of “the user holds his or her device”
 - use the plural “users hold their devices”



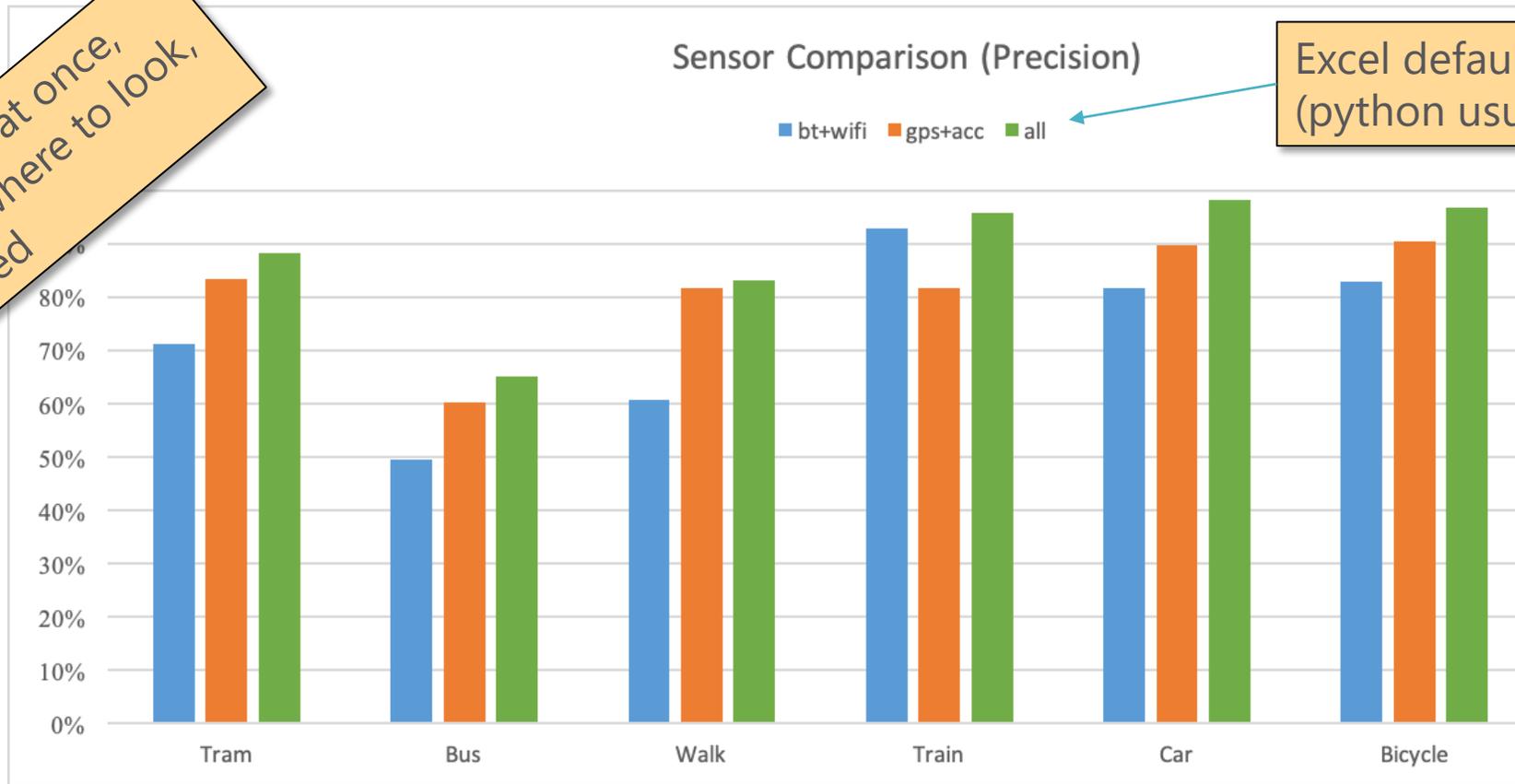
Slide layout

- Rule of thumb: **one train of thoughts** per slide
 - Bullet points / key phrases instead of sentences
- **Slide title** should summarize the content of the slide
 - In a meaningful and self-contained way
 - Sometimes people only read the title of a slide (→ newspaper headlines)
- For academic presentations **avoid logo**, name, date, etc. on every slide
 - This is not a sales pitch
 - Adds background noise
 - Risk of drawing off attention from content
 - but **DO use slide numbers** (essential in all academic communication)
- Font: sans serif
 - e.g. Open Sans Light, Arial, Tahoma
 - never a font with serifs, such as Times New Roman
 - few fonts, few sizes, few colours
- Font size
 - 12pt, **16pt**, **18pt**, **20pt**, **24pt**, **28pt**
 - must be always readable (also in graphs, e.g., axes labels)
- Do not overload the slides, exaggerating with
 - bullet points (max. 7 main items per slide)
 - too many/flashy animations
- Do not show too many details at once (see negative example on next slide)



Random Forest classifier, 38 BT features & 15 WiFi features

Compared to GPS+accelerometer only, BT+WiFi proximity patterns improve the classification
For **train**, BT+WiFi alone better than GPS+accelerometer by themselves

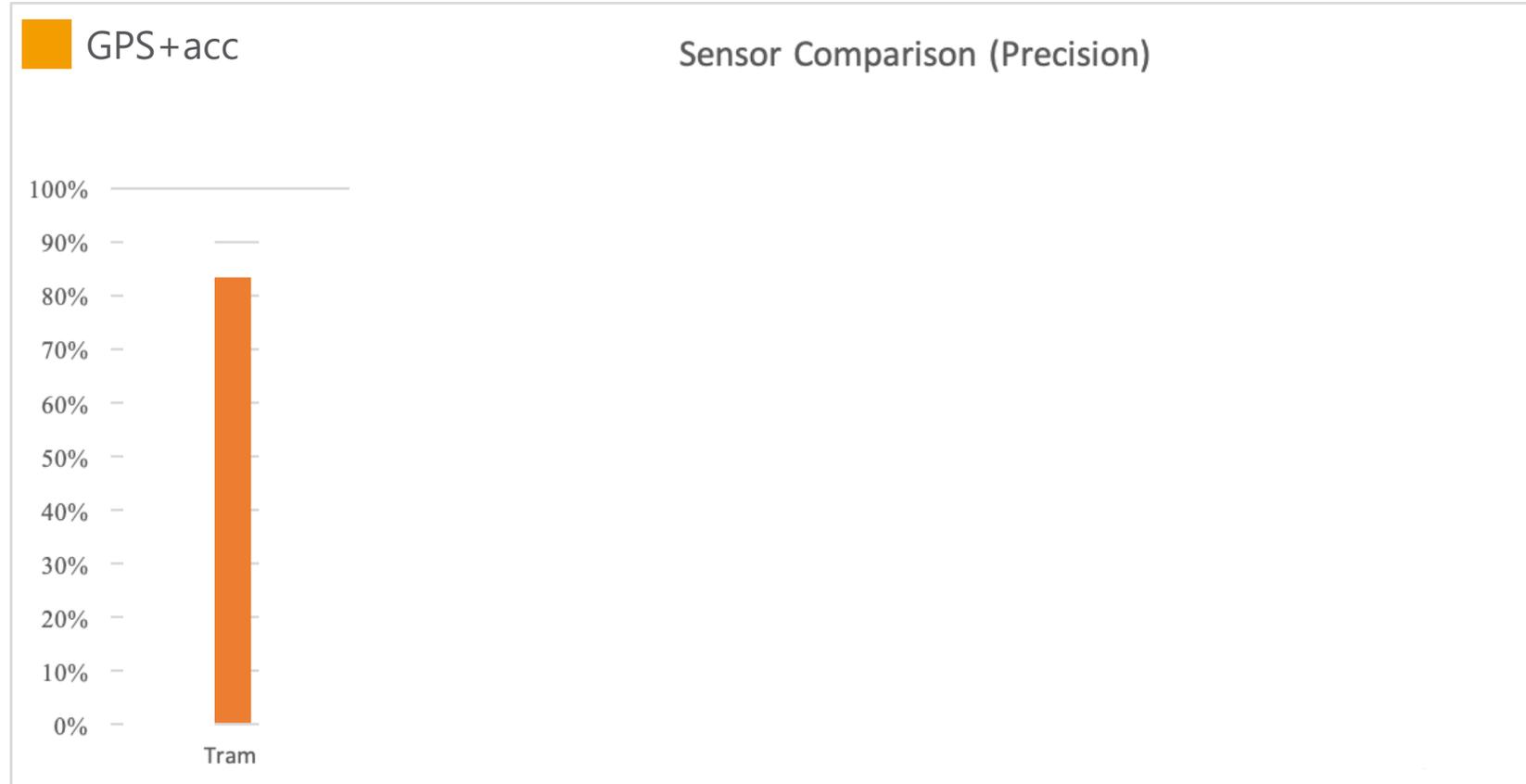


too many dimensions at once,
listeners confused where to look,
easily overwhelmed

Excel default: too small
(python usually worse)

Better!

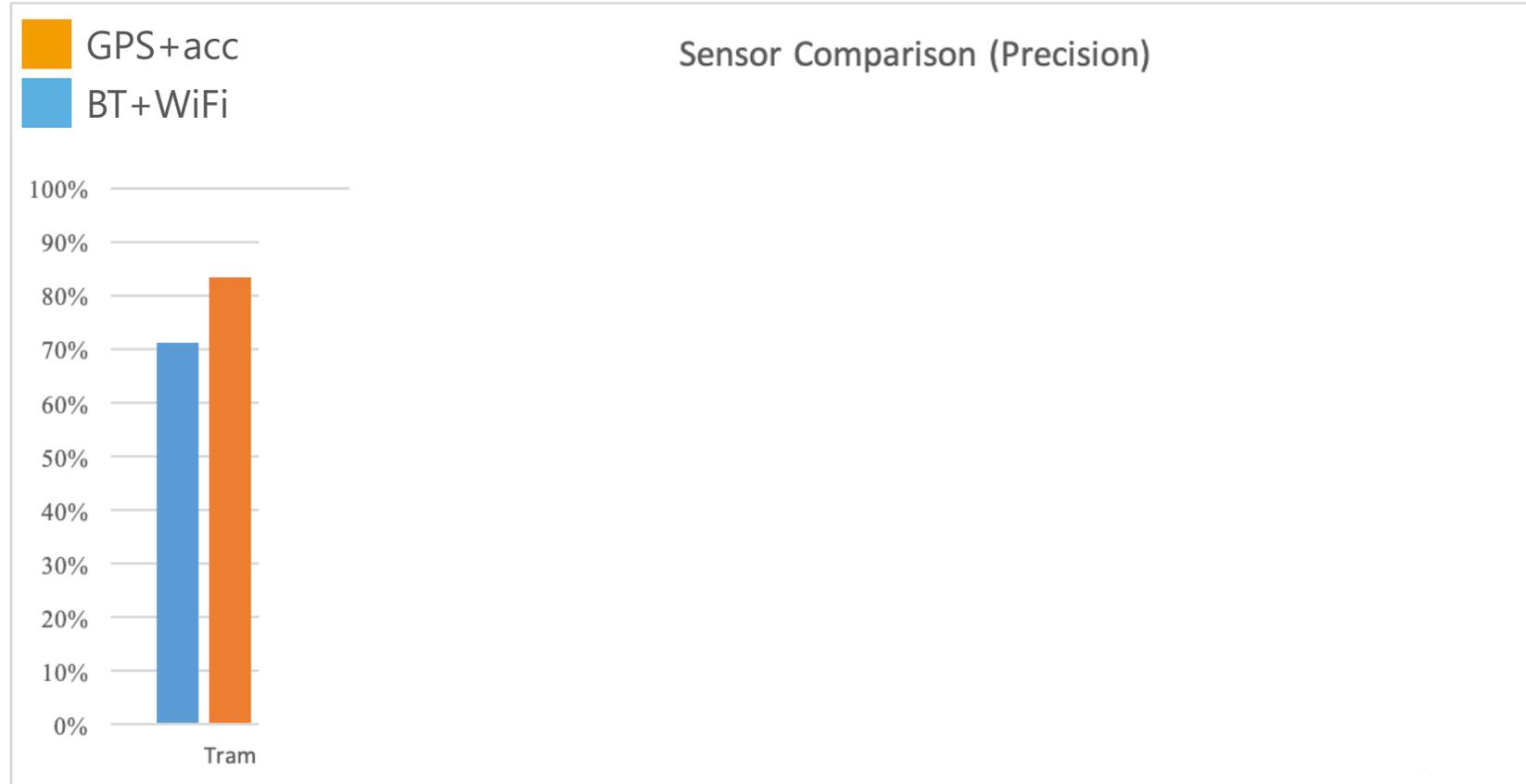
Random Forest classifier, 38 BT features & 15 WiFi features



Better!



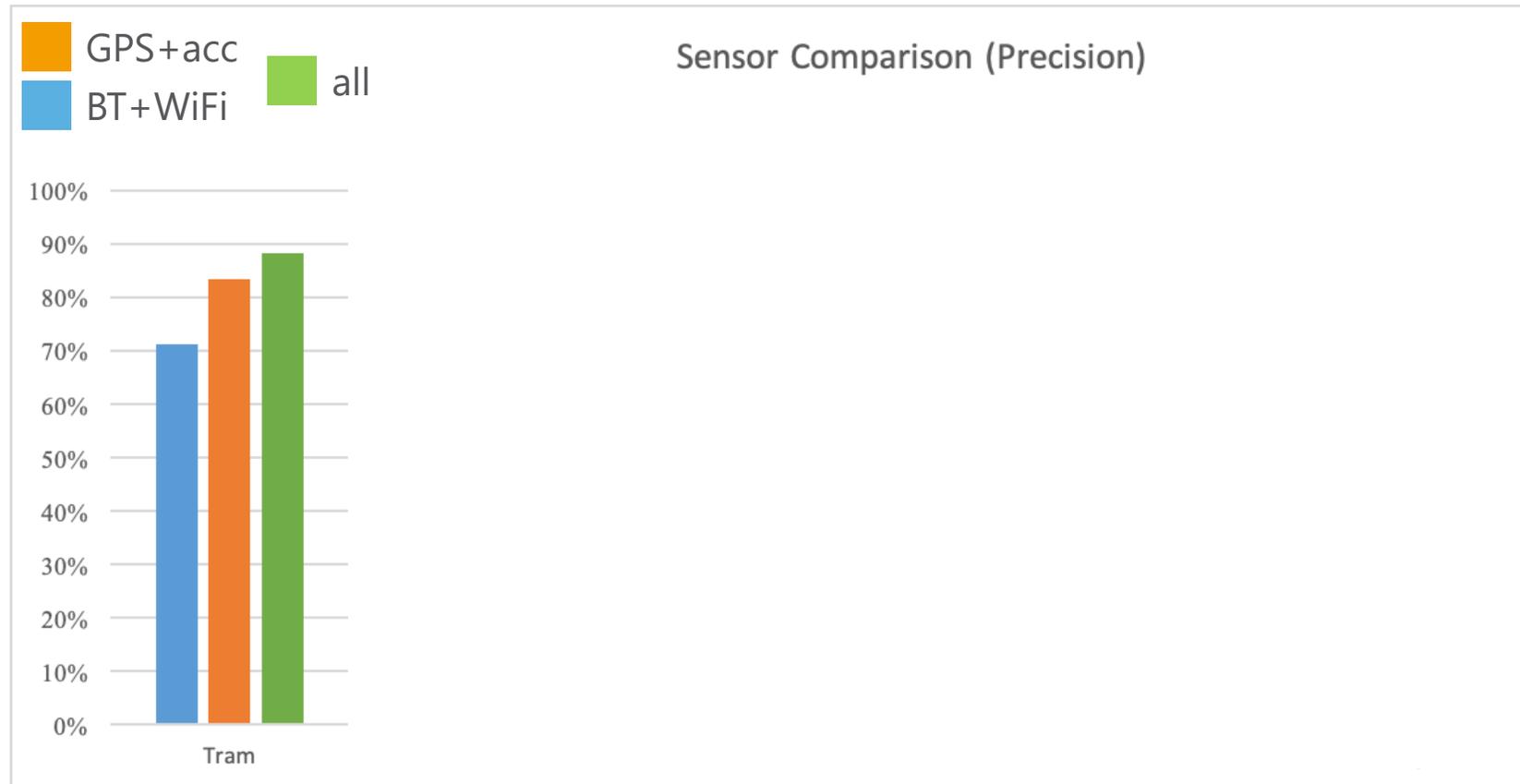
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Better!

Random Forest classifier, 38 BT features & 15 WiFi features

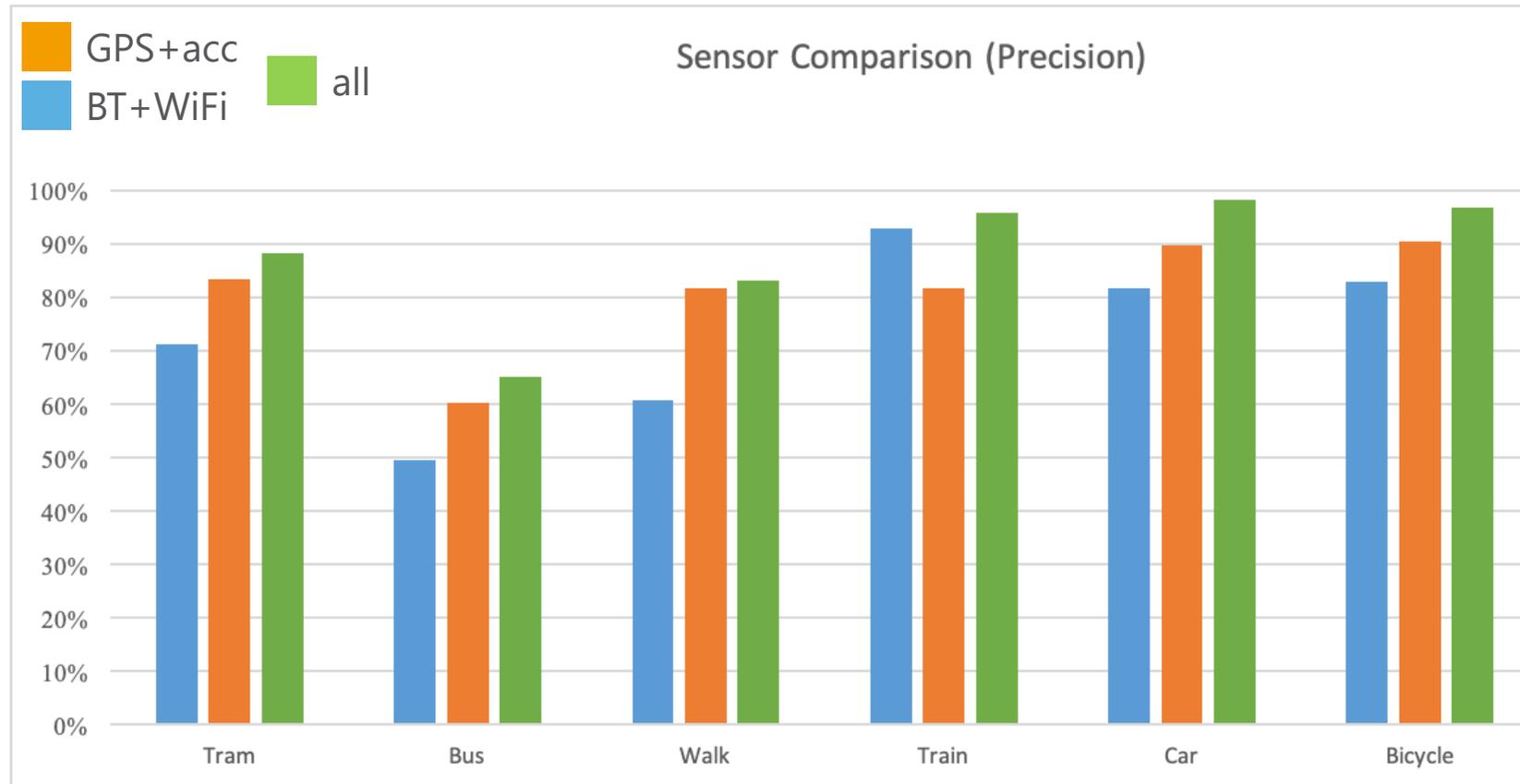
Compared to GPS+accelerometer only, BT+WiFi proximity patterns improve the classification



Better!

Random Forest classifier, 38 BT features & 15 WiFi features

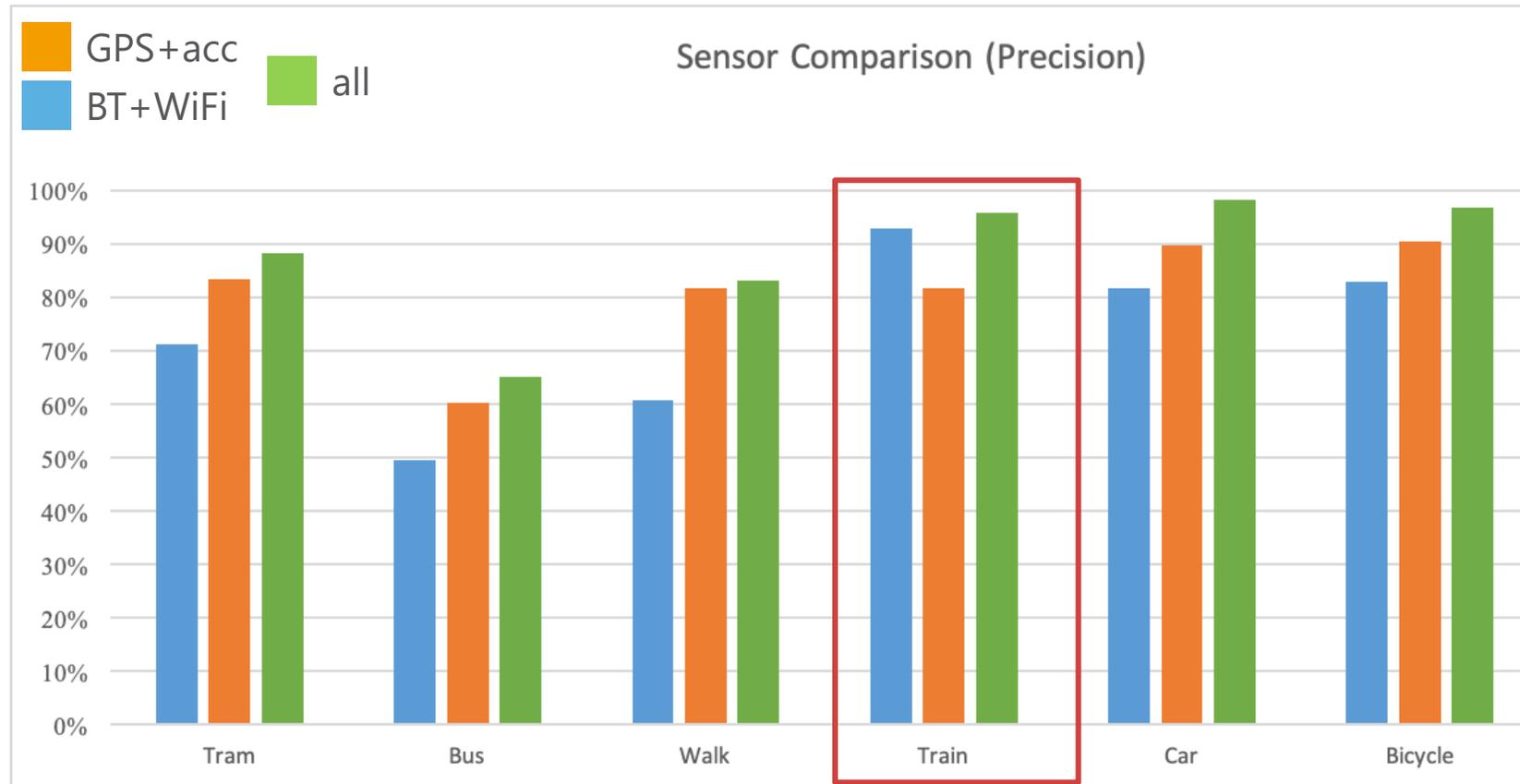
Compared to GPS+accelerometer only, BT+WiFi proximity patterns improve the classification **for all modes**



Better!

Random Forest classifier, 38 BT features & 15 WiFi features

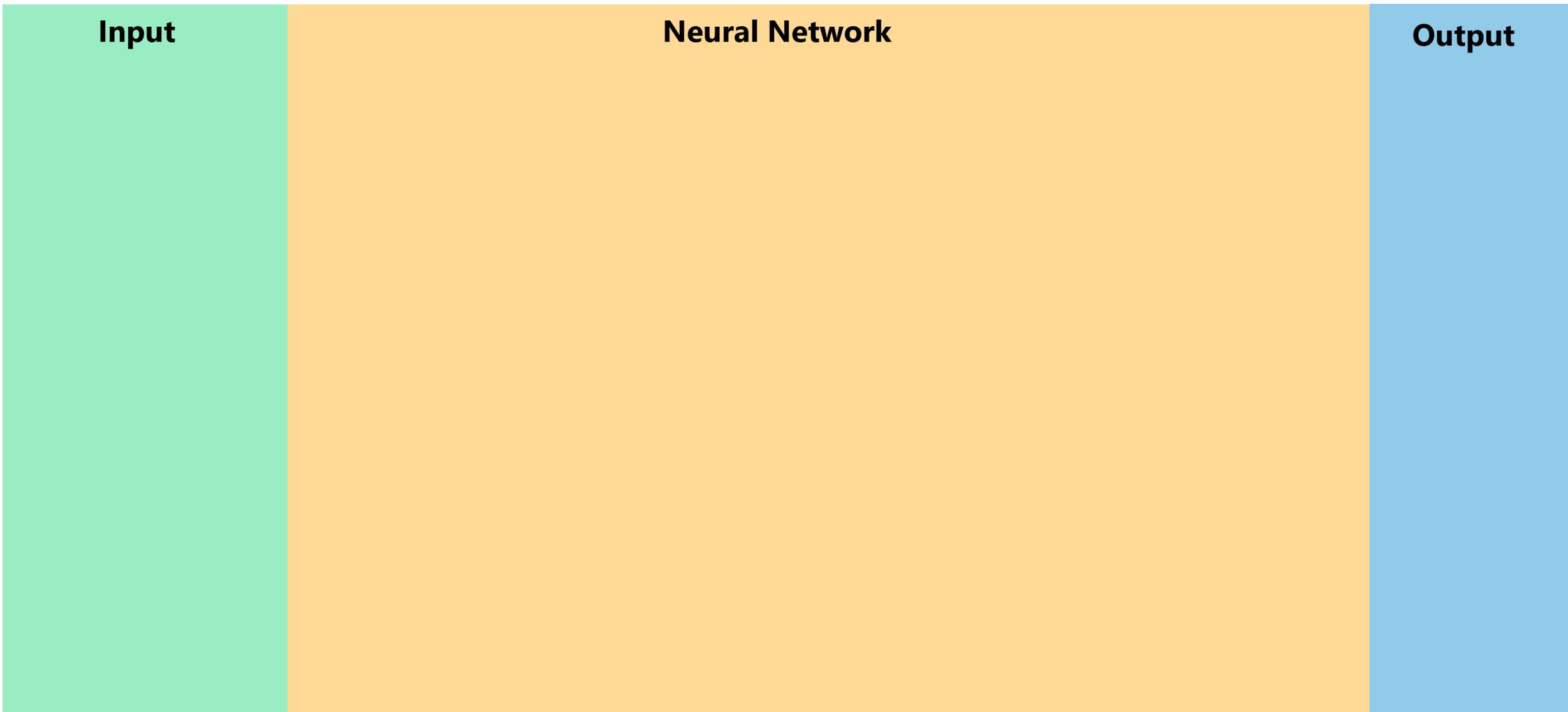
Compared to GPS+accelerometer only, BT+WiFi proximity patterns improve the classification **for all modes**
For **train**, BT+WiFi alone better than GPS+accelerometer by themselves





But certainly not every arrow and box needs to be animated by itself

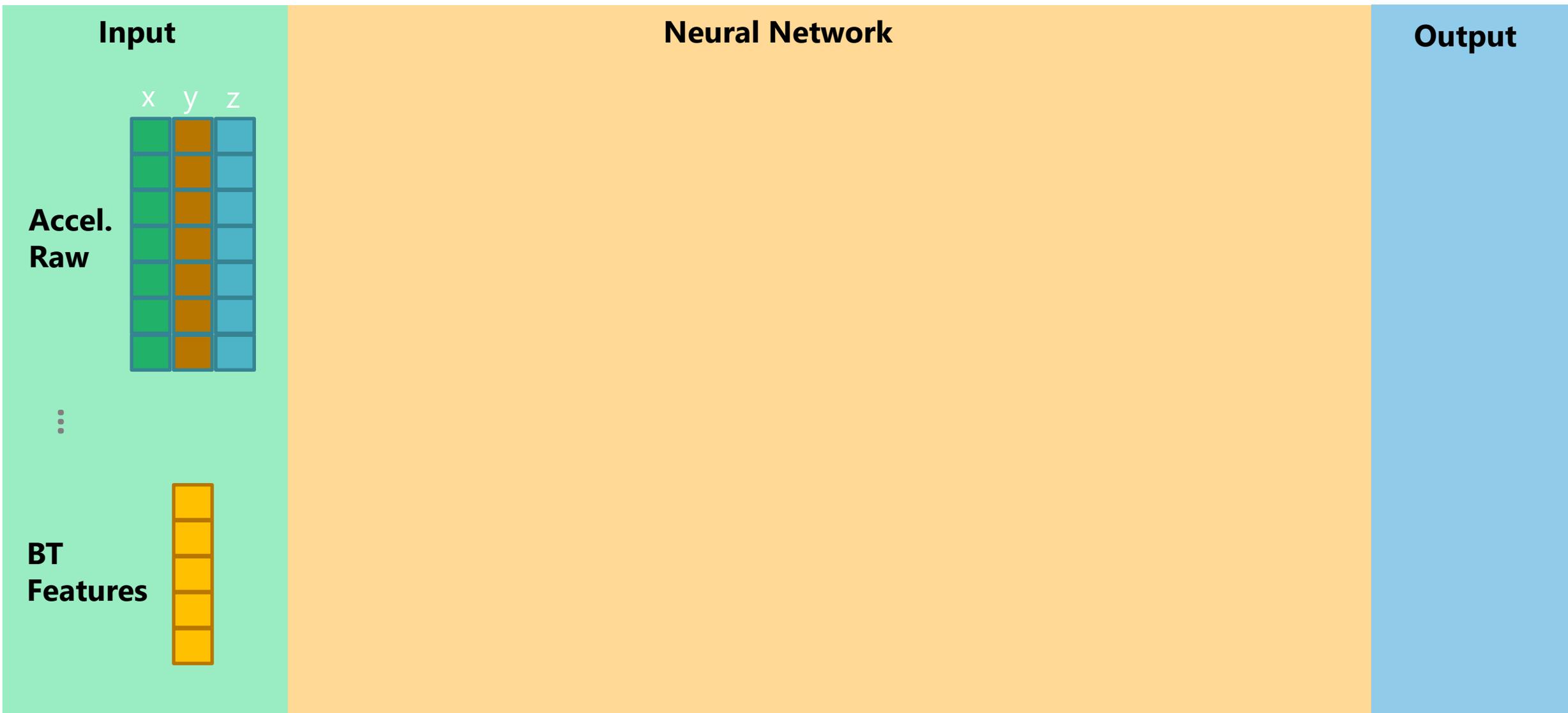
Find a balance between overwhelming and boring your audience





But certainly not every arrow and box needs to be animated by itself

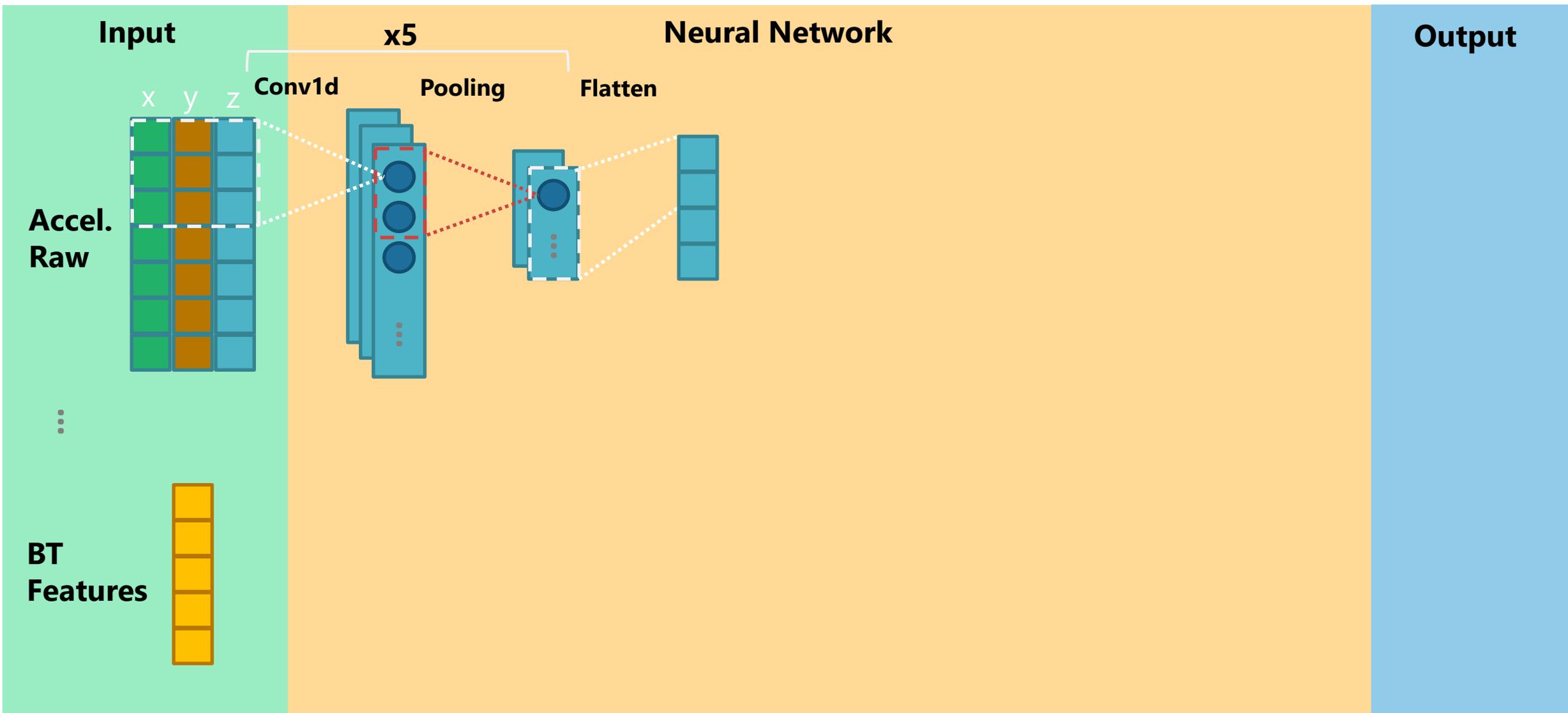
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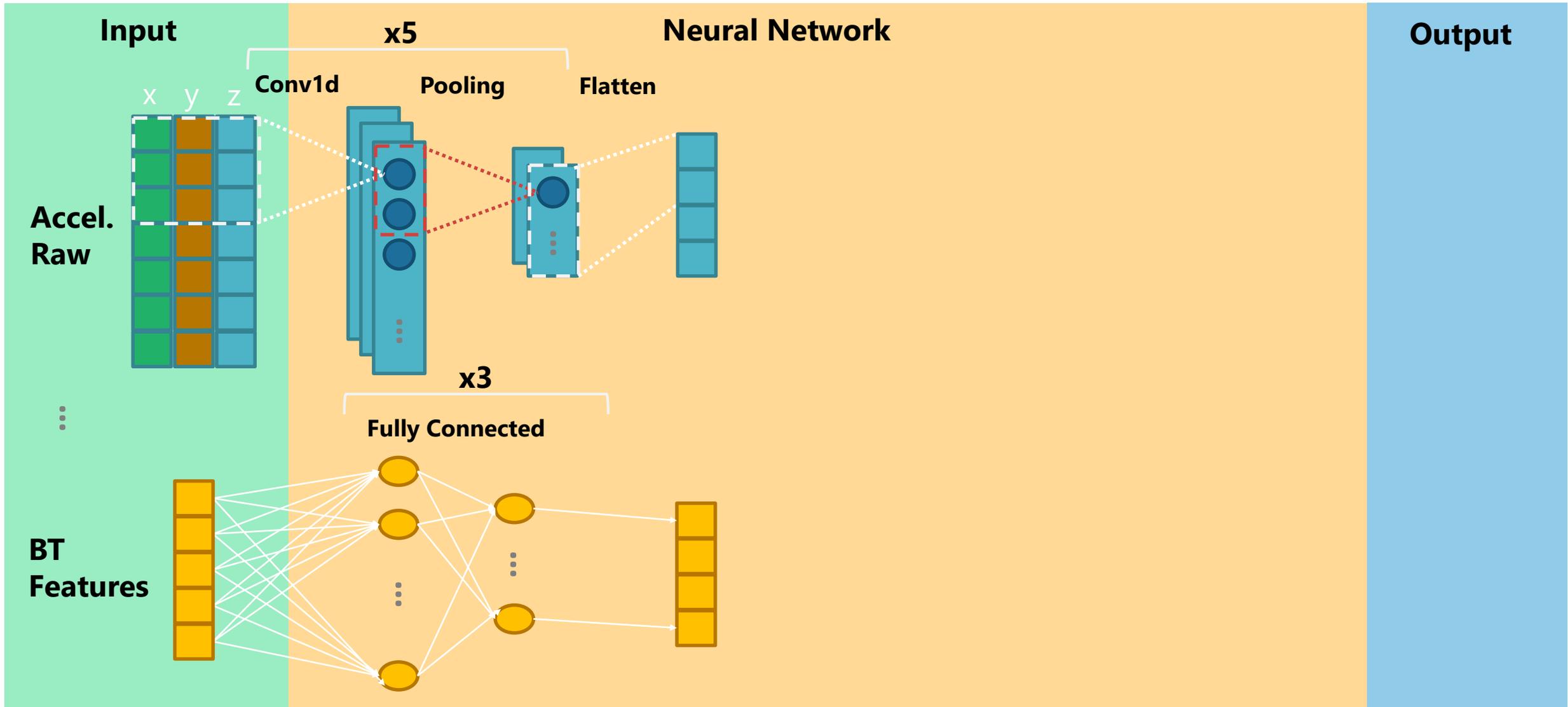
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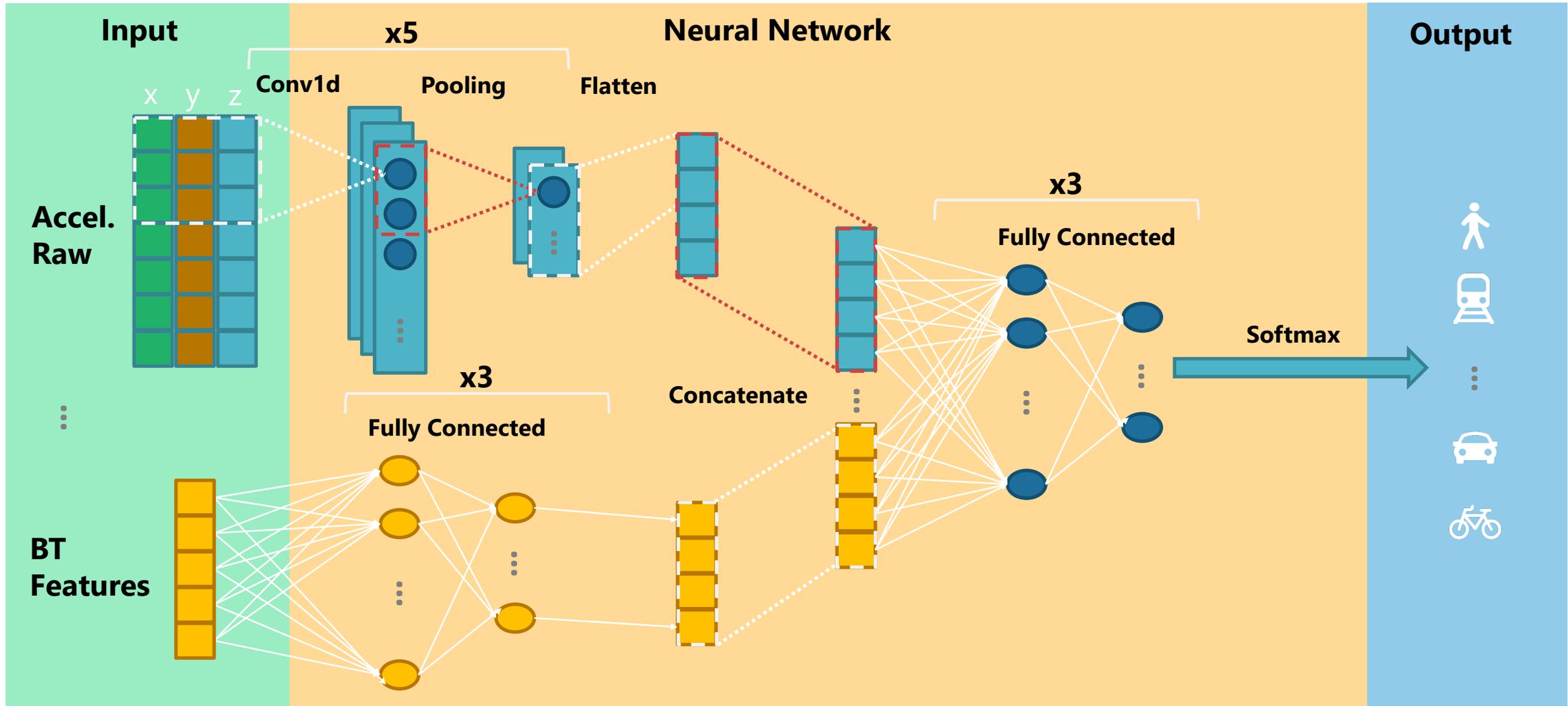
Find a balance between overwhelming and boring your audience





But certainly not every arrow and box needs to be animated by itself

Find a balance between overwhelming and boring your audience



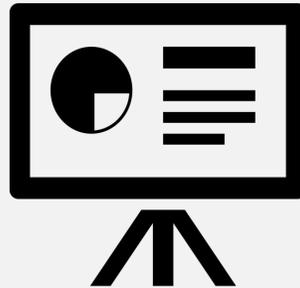
Acknowledging external material

- Make a clear difference between
 - your results, and
 - those of others
- Acknowledge everything included with copy-paste
 - images
 - graphics
 - text (even a single sentence)
- Acknowledge on the same slide
 - not lost in a mass of acknowledgements in the end
 - bottom right, grey is one option
- **Plagiarism** has many forms
 - copy & paste without explicit citation
 - paraphrase of text without reference
 - unacknowledged adoption of ideas, structure, design, ...
- .. an even more important topic for the written report
 - will be discussed separately

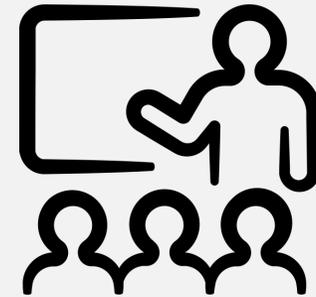
Developing and delivering scientific presentations



1. Choosing the content



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3. Delivering the talk



3. Delivering the talk



Preparation is key, start is important

Preparing and starting

- Be perfectly (and timely) prepared!
 - read the material weeks ahead
 - ponder on the content you would like to present
 - develop a top-down structure of your talk
 - have a first version of the talk ready a week ahead of time
 - practice the presentation (alone, with partner and colleagues)
- Know pretty precisely what you want to say for the first 2-3 slides
 - almost word for word
 - to take the edge off and get you rolling

Start with an outline?

- A matter of taste
- Do not spend too much time explaining the outline
 - High risk of boring your audience
 - List few, self-explaining items
- A (negative) example:
 - Introduction [*Necessary?*]
 - Topic 1
 - Subtopic 1 bla bla [*Avoid nested bullet points in the outline!*]
 - Topic 2
 - ...
 - Topic 7 [*too many items!*]
 - Summary [*Necessary?*]



During the presentation

- Most of the time, **look at your audience**
 - Not at slides, laptop, window, ...
- Do not focus on a single person (e.g., the most important person in the room)
 - unpolite towards the others
 - annoying for the recipient → counterproductive for you
- Speak
 - slowly (enough), loudly (to fill the room), fluently
 - free (do not memorise the talk), make pauses
- Remember to **breathe**
 - a trick that forces you to: from time to time, stop to take a sip of water
- **Engage** with your audience
 - eye contact
 - questions
 - provocations, contradictions, surprises (risky, but effective teaching/learning method)
- **Motivate** your audience
 - by conveying your own enthusiasm
 - try reflecting in your tone the relevance of what you just present
- Be happy and calm
 - and remain authentic
- Be ready to dynamically skip slides when running out of time
 - planned in advance, jump directly to new slide





Two semantically different topics on same slide – do what I say, not what I do 😊

Almost done!

- Do not leave important questions unanswered at the end of the presentation
 - Open issues should be explicitly addressed
- Provide a summary of the presentation's main message
- Try to close the circle
 - link the results at the end to motivating questions at the beginning

Summary

- Start by thinking about the content you want to convey
 - read the materials (if not your own work)
 - whom are you talking to?
 - how much time do you have?
 - what do you want/need them to learn?
- Plan the structure of your presentation
 - top-down
 - address limitations, uncertainties, doubts, etc
- Design clean slides
 - that do not overwhelm or try to sell, but convince
- Be happy and calm



“Once you learn the rules, you can (cautiously) break them”
... and develop your own style

Van Gogh as we know him



V. Van Gogh: Thatched Cottages in Chaponval, 1890
(Kunsthau Zürich, own photo)

Early Van Gogh



V. Van Gogh: Carpenter's Workshop as seen from the Artist's Atelier, 1882
(Rijksmuseum Amsterdam, museum photo)



More info and much of the inspiration for this presentation

- Prof. Friedemann Mattern, [How to give good seminar presentations](#)
 - partly organised differently
 - more emphasis on images, schemes, graphics, and
 - organising the information for easier digestion (in particular slides 29-30)
- Prof. Markus Plüschel, [How To Give Strong Technical Presentations](#)
 - partly organised differently
 - in-depth discussion of the structure of the presentation (slides 25-42, i.e. pages 13-21)
 - links to many further sources
- Now let's get rolling!