SCC.NRG.AI4ME: Self-optimising distributed encoding nodes.

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Acknowledgements

Supervisors: Dr Haris Rotsos, Prof Nick Race

Overview of Today's Presentation

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What is an object in object based media?

- Customisation of Characteristic, but the meta characteristics remain constant.
- Large customisable overlap, but not computationally feasible on the client-side.

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Bring the Object Based Media (OBM) principle lower down the tool-chain.
Most Compression Algorithms, make use of the 2D DCT II/III as part of their compression/analysis (Think MPEG).

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Theorem

let position be time-series like such that.

$$A = \{S_0^A \cdots S_n^A\}, B = \{S_0^B \cdots S_m^B\}$$

where for a given object S_x assume.

$$S_x \in A, S_x \in B$$

$$A = \{S_x | \Sigma_1\}, B = \{S_x | \Sigma_2\}$$

such that.

$$\Sigma_1 \notin B, \Sigma_2 \notin A$$

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But how do you identify S_X? No idea.

Theorem

Assume S_x is identified, and we remove signal S_x from the sets.

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$$B = \Sigma_2 = \{S_y | \Sigma_3\}, C = \{S_y | \Sigma_4\}$$

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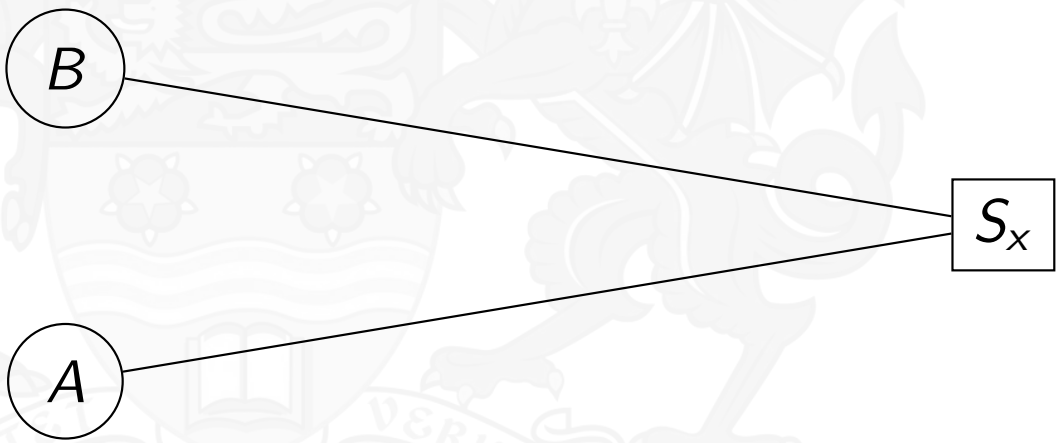
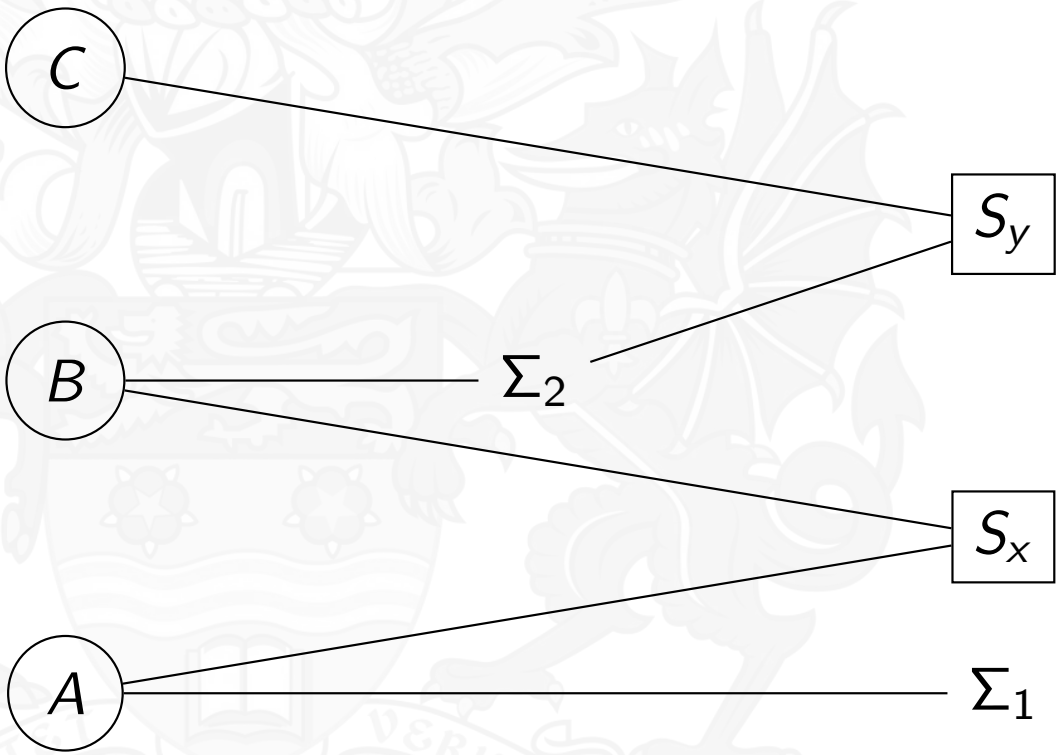
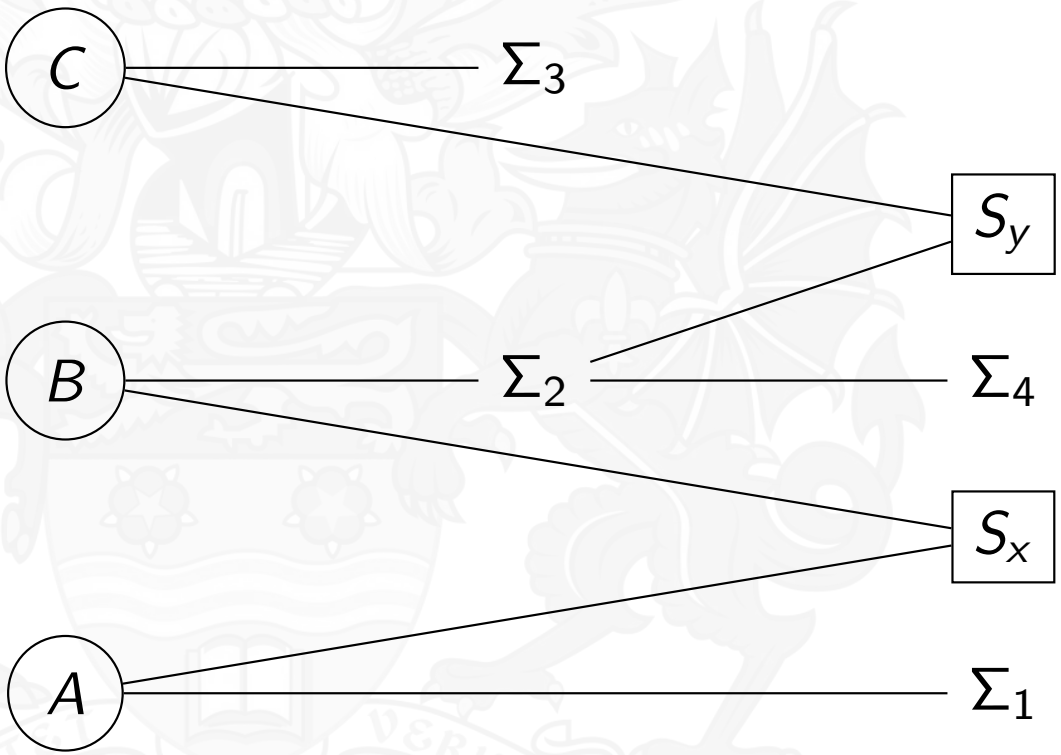
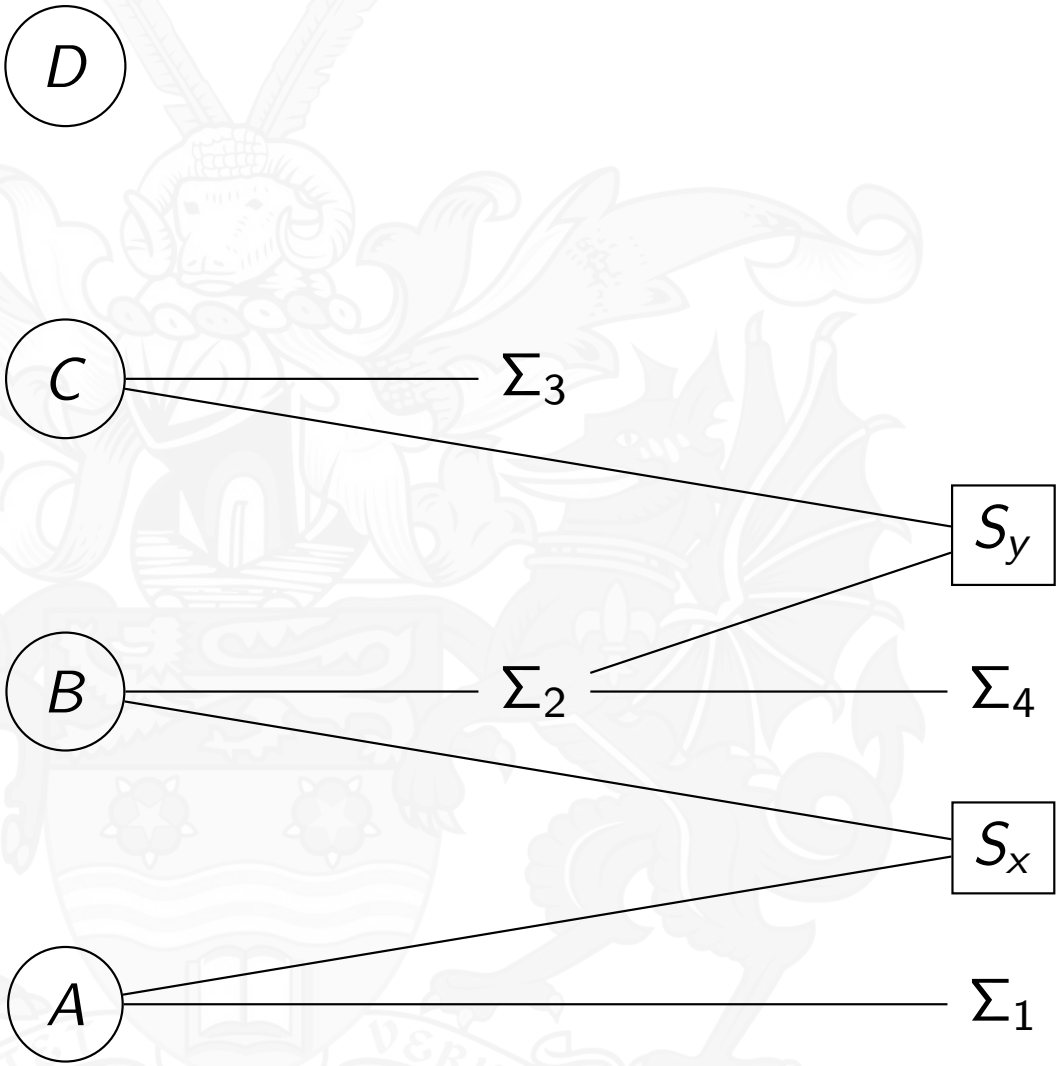
Figuring out if S_y is not in A or S_x? No Idea.

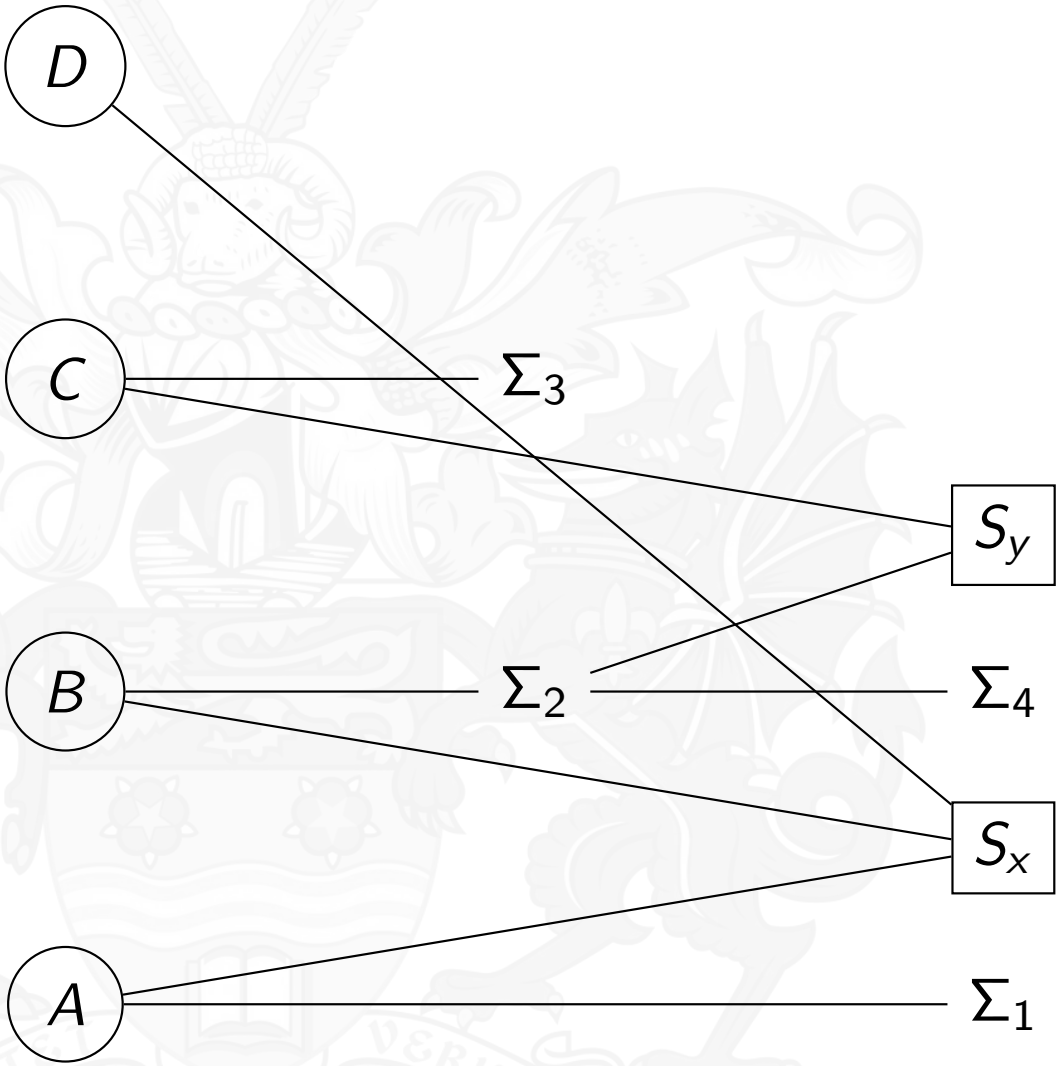

B
A
S_x

High Level Overview
Self-Optimising Objects




C
B
A
Σ_3
Σ_2
Σ_4
Σ_1
S_y
S_x


D
C
Σ_3
S_y
B
Σ_2
Σ_4
S_x
A
Σ_1


D
C
B
A
Σ_3
Σ_2
Σ_4
Σ_1
S_y
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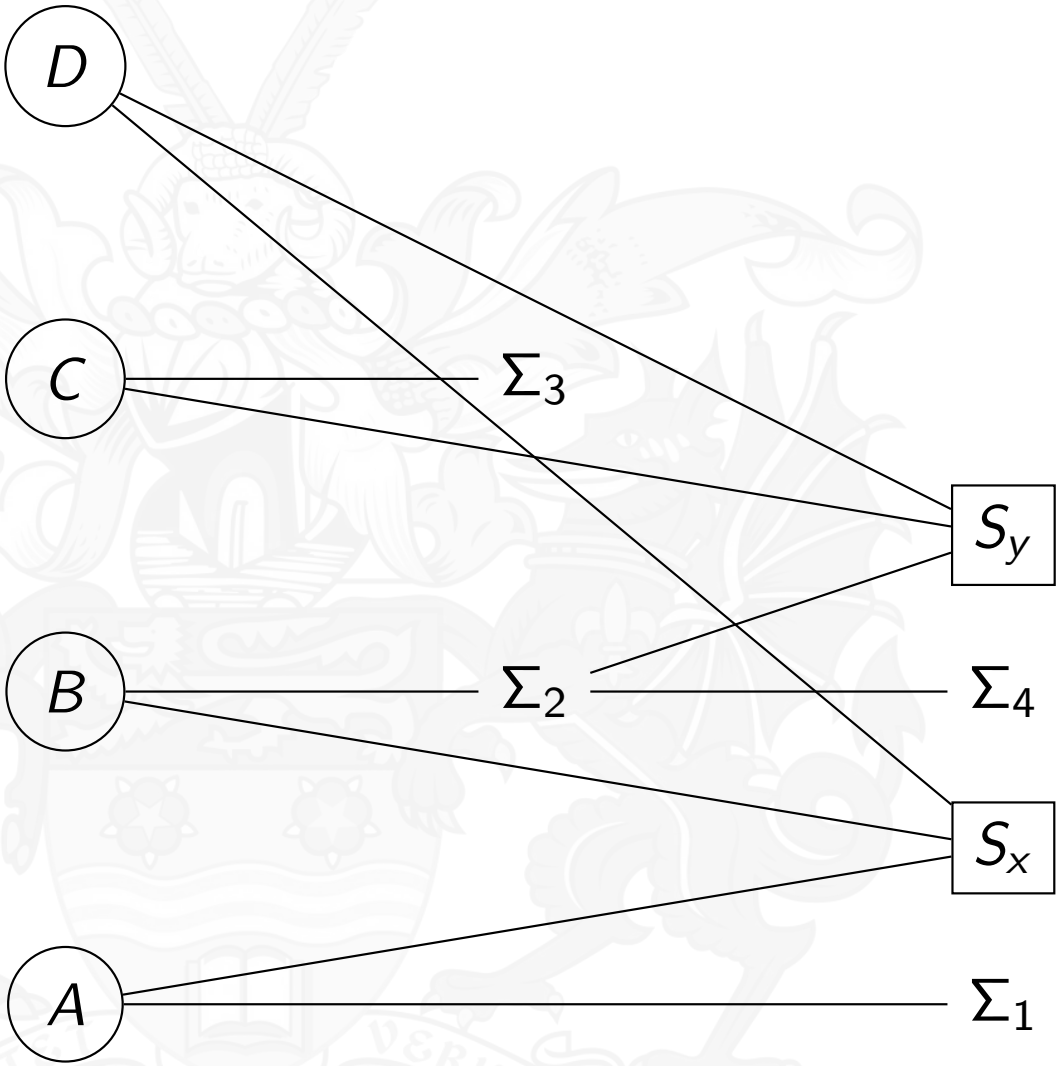
D
C
B
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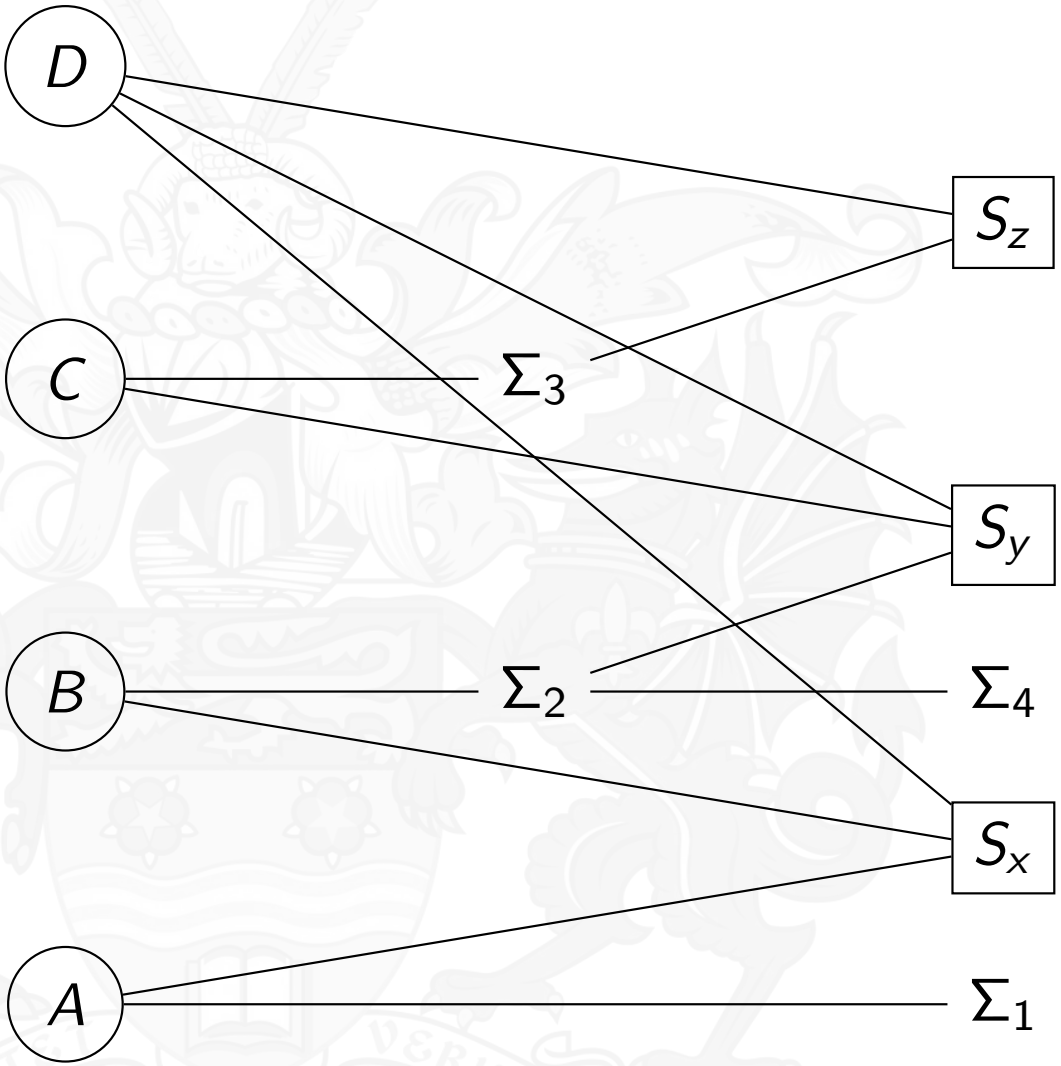
D
C
B
A
S_z
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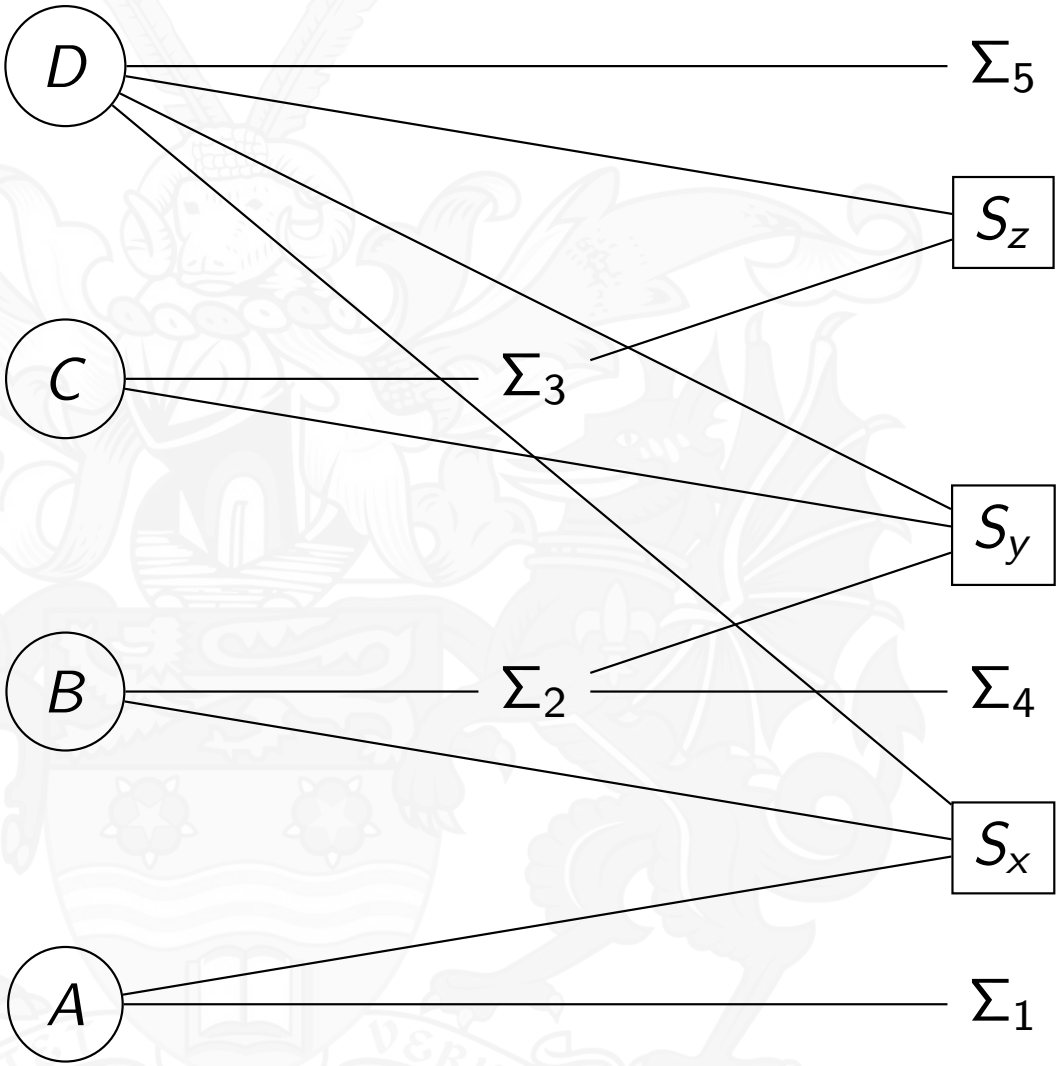
D
C
B
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Σ_5
S_z
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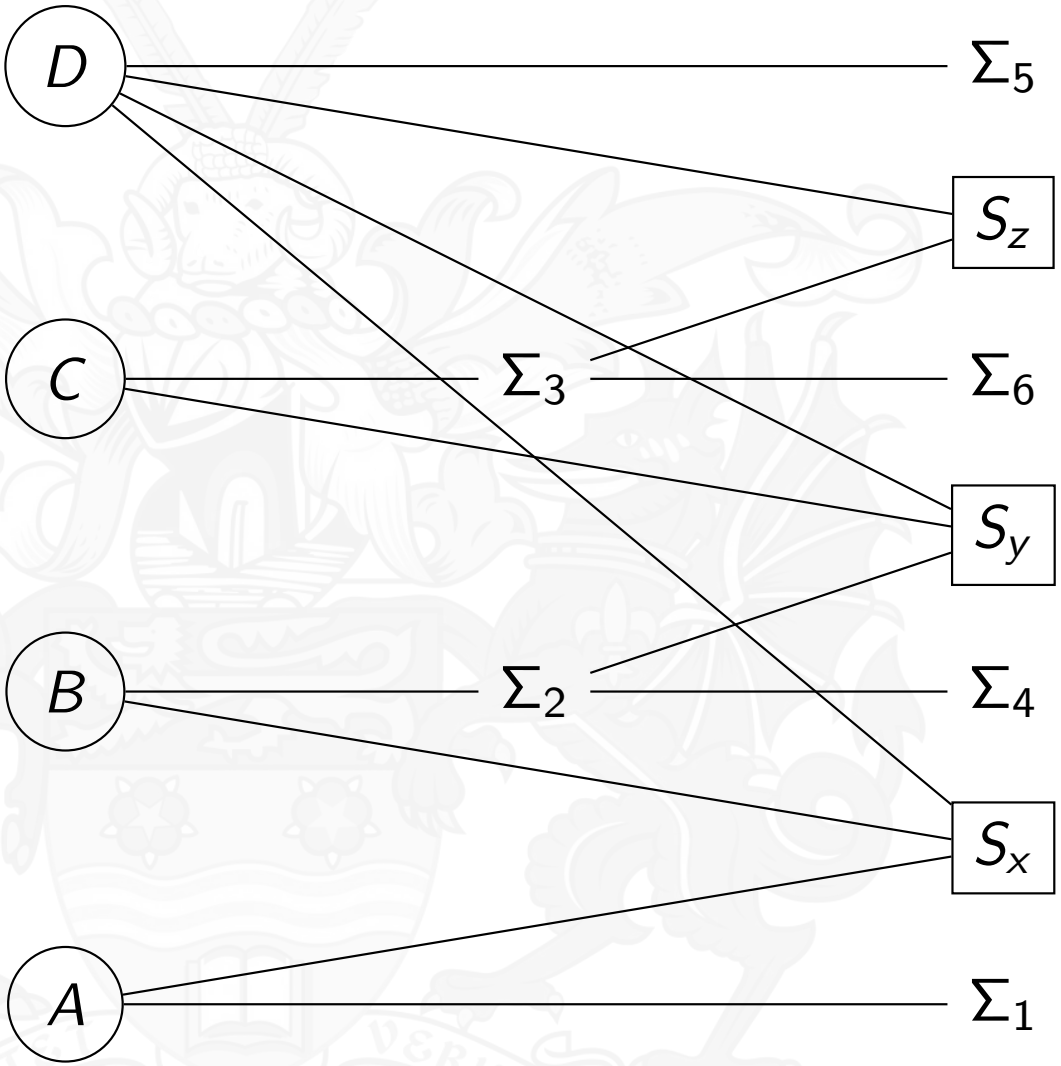
D
C
B
A
Σ_5
S_z
Σ_3
Σ_6
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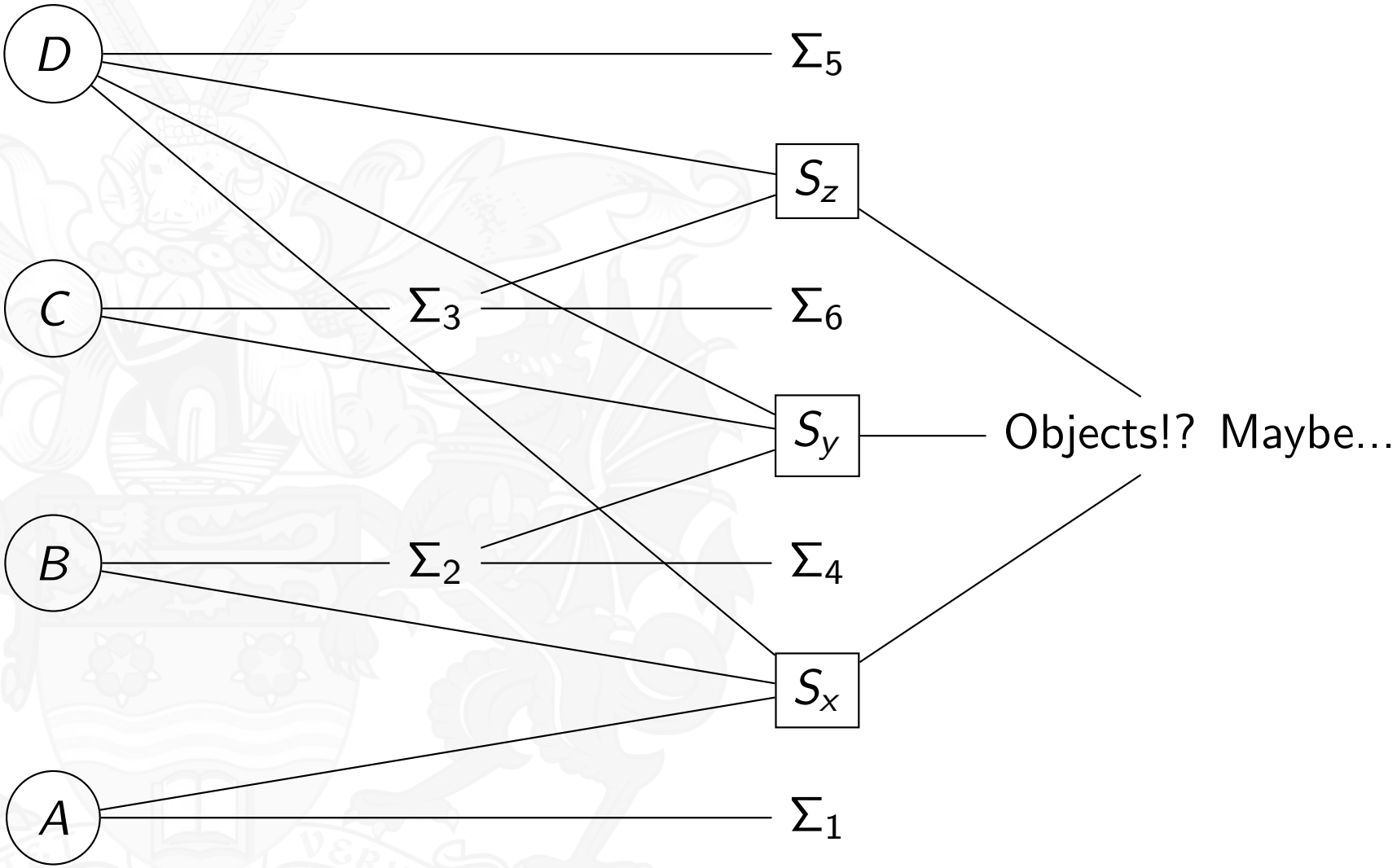

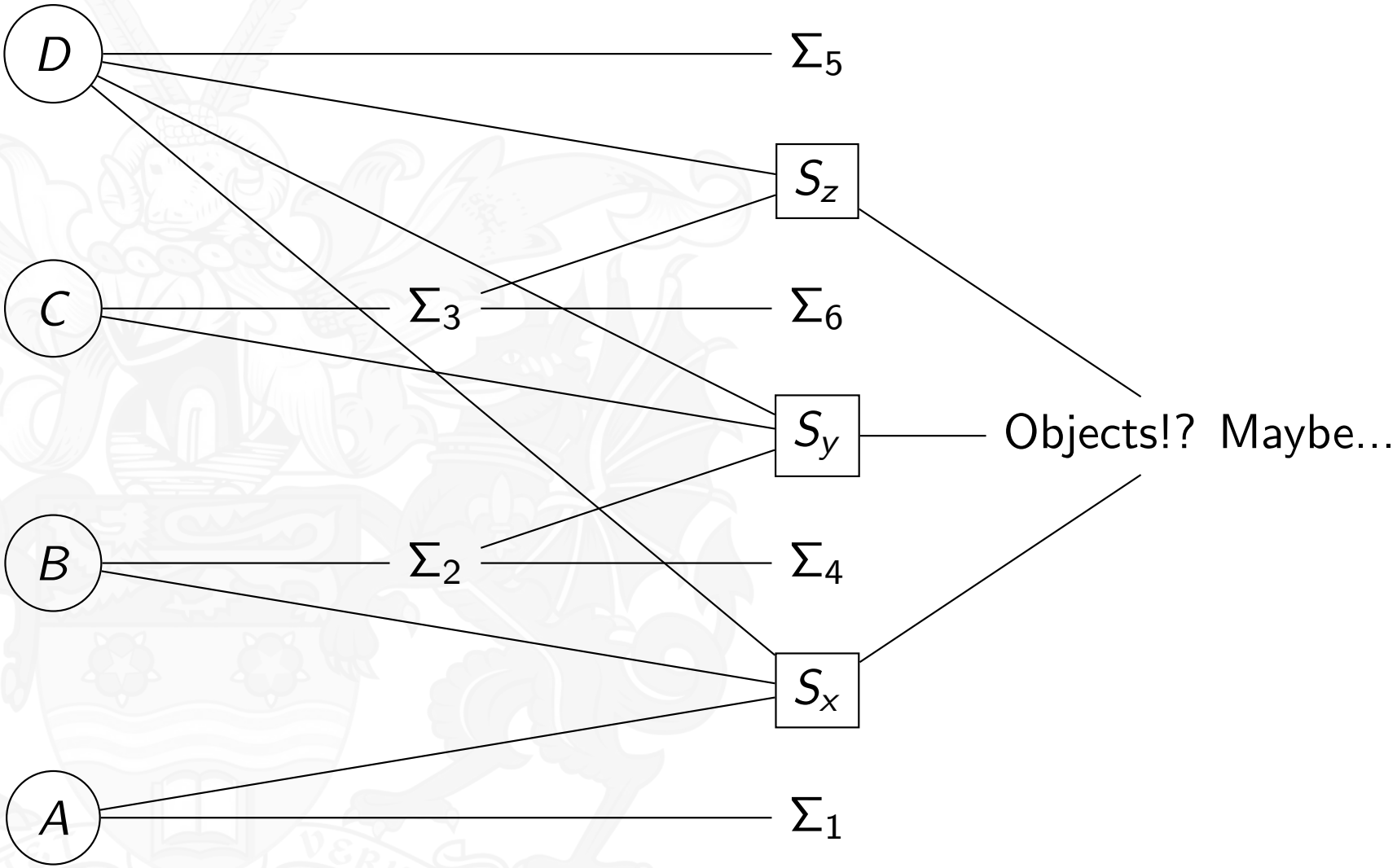

How do you optimise the ordering for encoder objects? No idea.

Toy Example

Alice, Bob, Charlie, Dave

Client	Servicing Nodes
A	Σ_1, S_x
B	Σ_4, S_x, S_y
C	Σ_6, S_y, S_z
D	Σ_5, S_x, S_y, S_z

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Theorem

assume that if the set is an itemised set of objects.

$$\Sigma_n \rightarrow \emptyset$$

Discard Σ_n as remainder Over large number of nodes.

$$A = S_x, B = S_x, S_y \cdots$$

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How to Assess if Σ_n is just artefact or truly unique? No idea.

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Example

Add a new Client E. Existing parts of E that are already cached closer to the client fetch faster / optimisation to identify similar signals from a lower-quality/partially computed version.

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E	Σ_7, S_z, S_y

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But how to identify S_z in E without full render? No idea.

Generating Objects

How do you generate objects dynamically?

Assuming that both signal A and B are correlated if they contain the same object with a different single change.

- Cross-Correlation?
- Steerable Pyramids?

Current Idea...

Optimisation of an Object Tree

How do you optimise extraction of signals?

Network Distribution

How do you distribute this over a network?

Encoding/Decoding Weights

How do you identify ways to optimise self consumption/propagation

Dynamic Generation

Identifying Objects as Code (OaC) and their applications

PATET
OMNIBUS
VERITAS