Consciousness Turing Machine Handbook

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CTM-AI Input and Output

System Input

Text-based query, e.g. How is the whether today?

Text-based information, e.g. The whether is 3 degrees to 15 degrees.

Image-based information, e.g. an outdoor image

Video-based information, e.g. a sky video

System Output

Text-based answer to the query, e.g. Sunny

CTM-AI Key Concept

Terminology about architecture

CTM: the main system taking multimodal input and generating final output

For each CTM, it includes 2 subcomponents:

Processor: take modality-specific input and generate text-based gist

Supervisor: take one gist and output the final answer to the query

For each processor, it includes three subcomponents:

Executor: responsible for generating the output, e.g. LLM / VLM

Scorer: responsible for generating the relatedness, confidence, and surprise of the gist conditioned on the query

Messenger: responsible for updating the information and formatting

CTM-AI Concept

Terminology about input and output

Query: The question that user wants to get answer from.
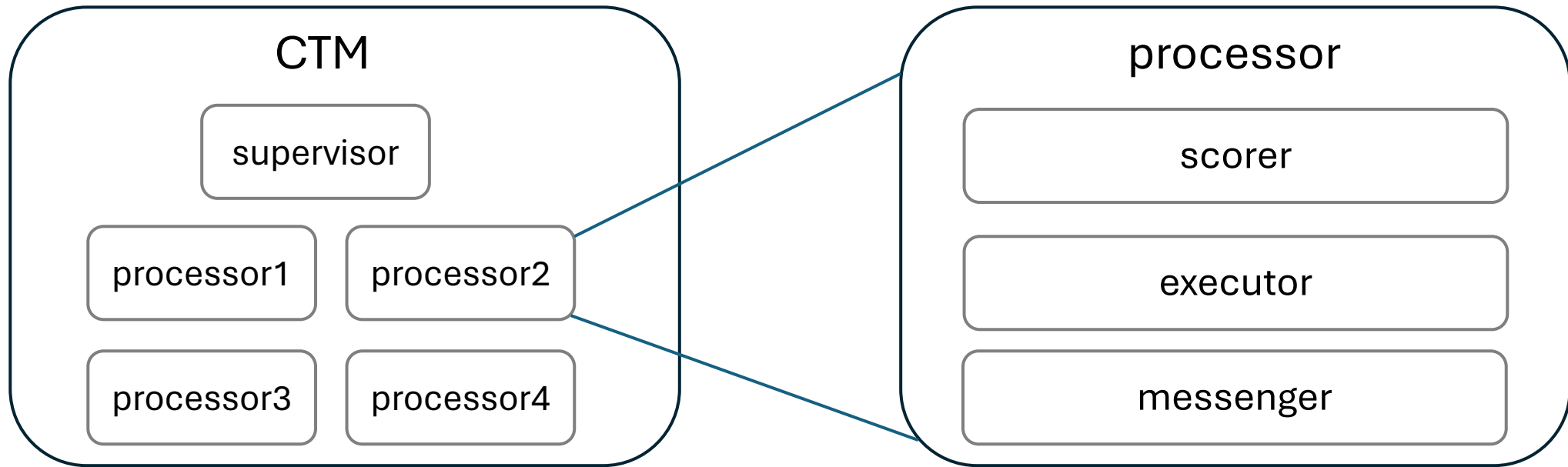
Text Input: Context information that the CTM system relies on to answer the query.

Audio/Image/Video Input: Multimodal information that the CTM system relies on to answer the query.
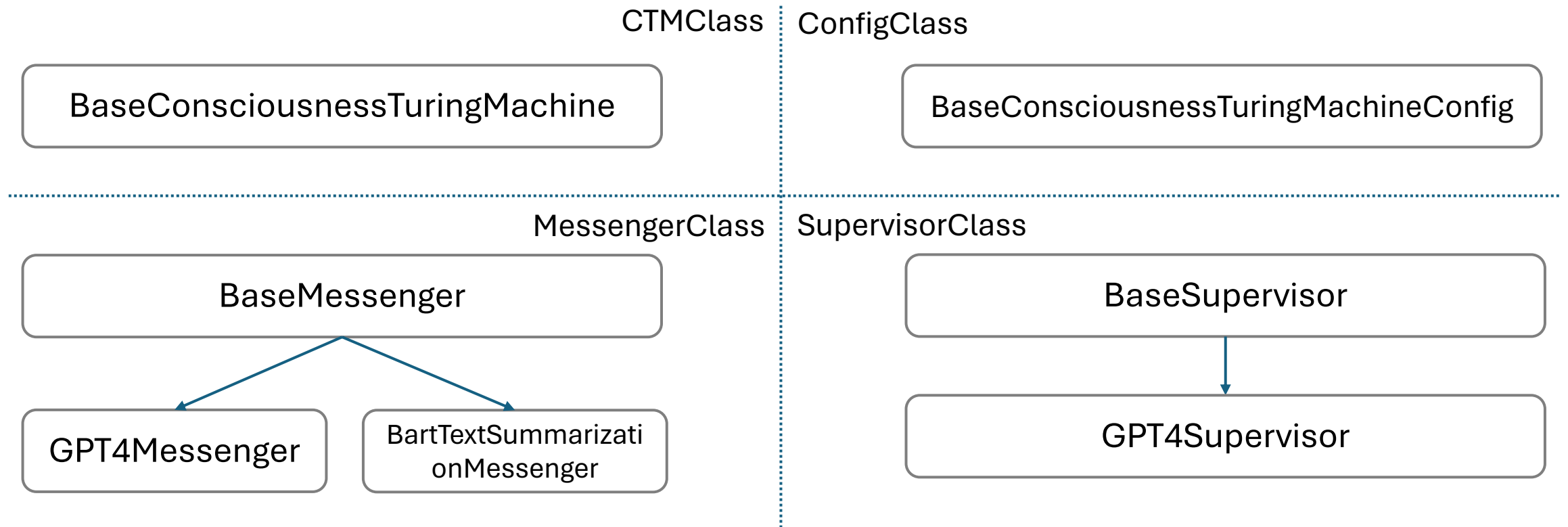
Gist: The output information from one processor. Normally just sentence-level key information about the input.

System Output: the supervisor's answer to the query
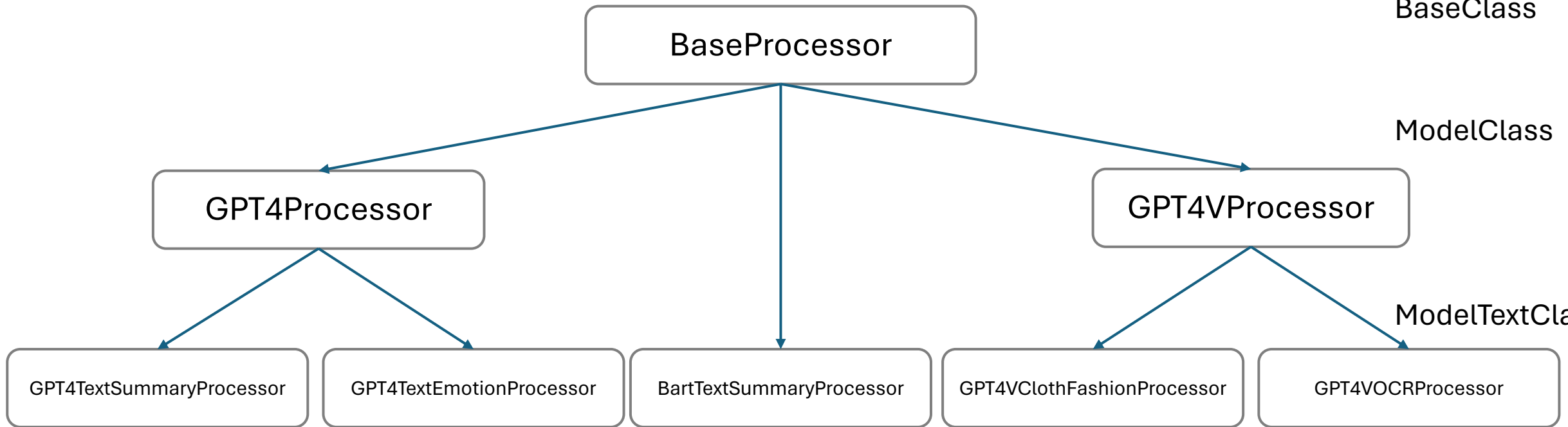
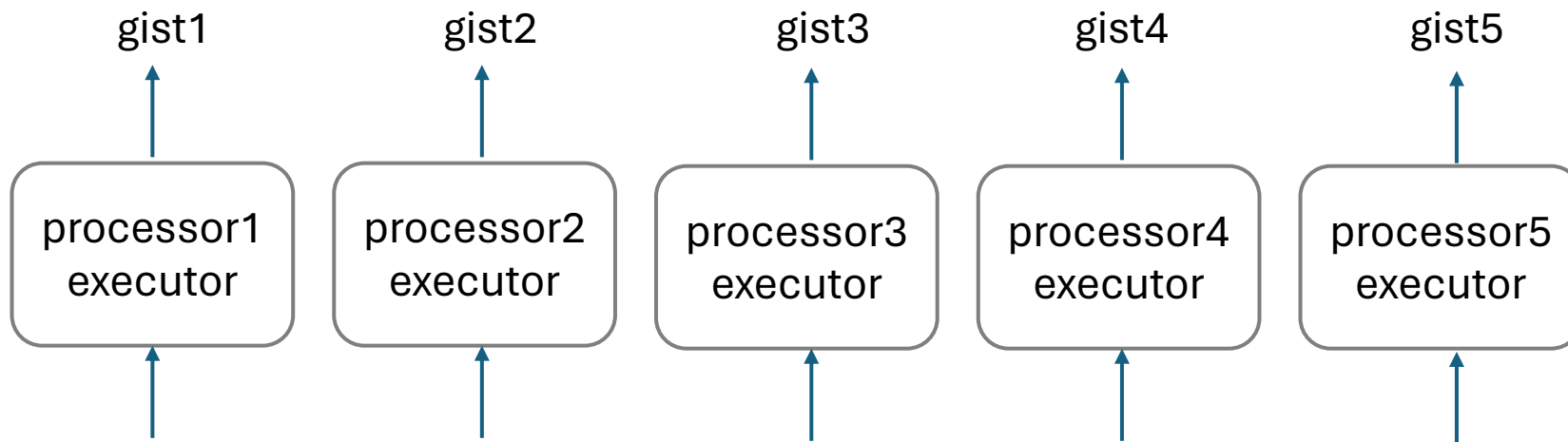# CTM Architecture

CTM Class Diagram

CTM Class Diagram

CTM Key Function

Forward Function1: ask processor in parallel

CTM Key Function

Forward Function2: ask score

score = (relatedness, confidence, surprise)

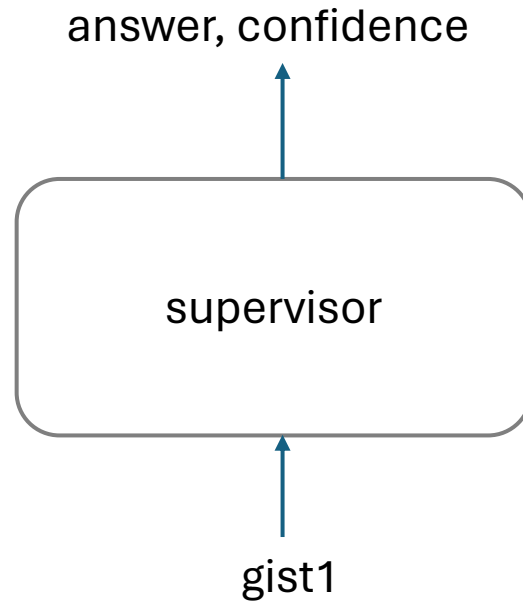score1   score2   score3   score4   score5

query →

processor1 scorer	processor2 scorer	processor3 scorer	processor4 scorer	processor5 scorer

gist1   gist2   gist3   gist4   gist5
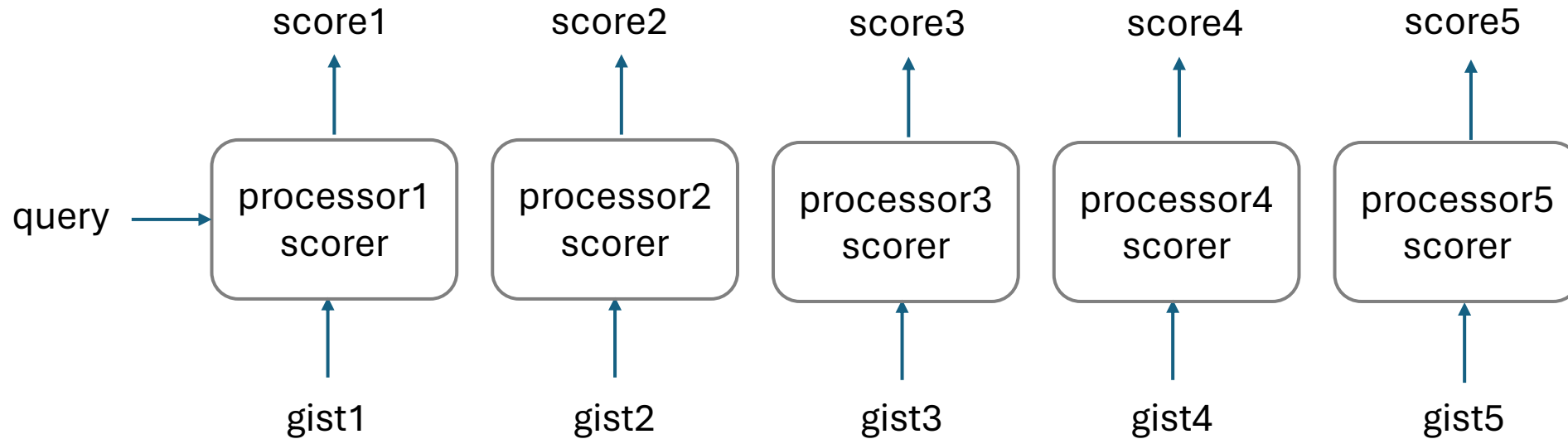
CTM Key Function

Forward Function3: up-tree competition
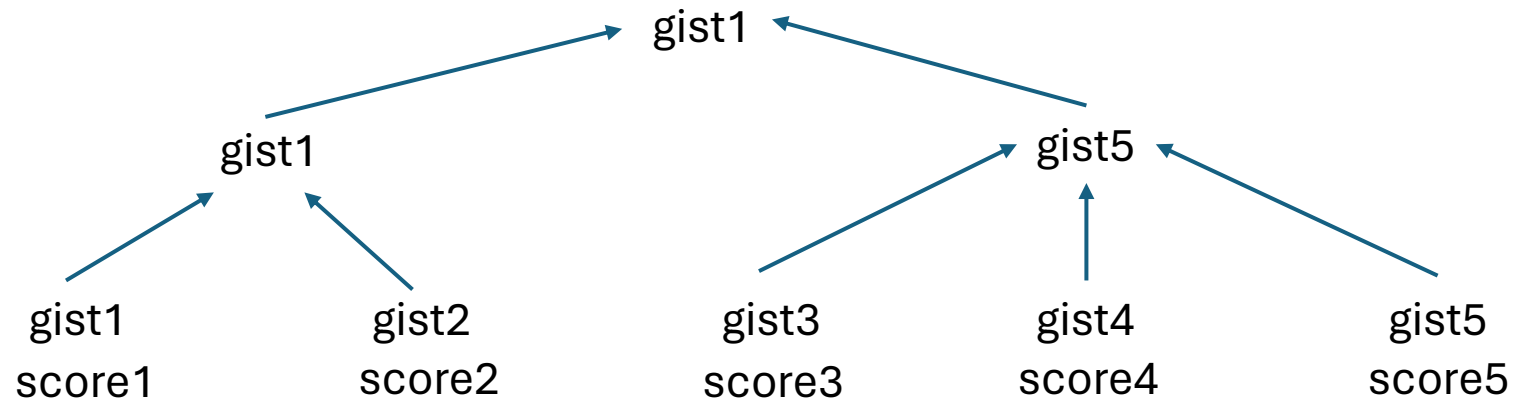
CTM Key Function

Forward Function4: ask supervisor
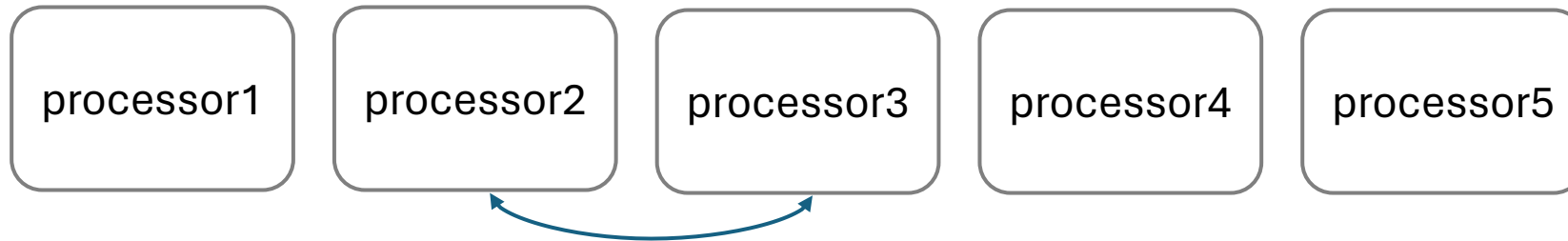
answer, confidence

supervisor

gist1

CTM Key Function

Backward Function1: down-tree broadcasting
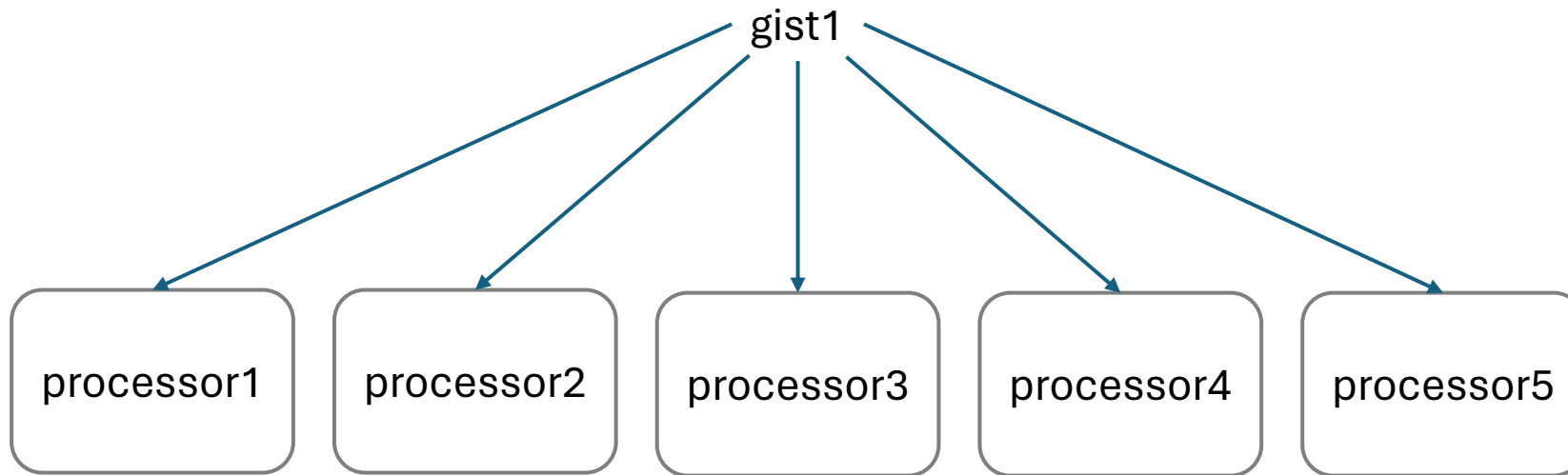
CTM Key Function

Backward Function2: link form

CTM Key Function

Backward Function3: processor fusion