

Define "middle ear" (\mathbf{x})

Question Answering:
Question Query

Barack Obama was
born in Hawaii. (\mathbf{x})

Fact Verification: Fact Query

The Divine
Comedy (\mathbf{x})

Jeopardy Question
Generation:
Answer Query

End-to-End Backprop through \mathbf{q} and \mathbf{p}_θ

Query
Encoder

Retriever \mathbf{p}_η
(Non-Parametric)

Document
Index

Generator \mathbf{p}_θ
(Parametric)

The middle ear includes
the tympanic cavity and
the three ossicles. (\mathbf{y})

Question Answering:
Answer Generation

supports (\mathbf{y})

Fact Verification:
Label Generation

This 14th century work
is divided into 3
sections: "Inferno",
"Purgatorio" &
"Paradiso" (\mathbf{y})

Question Generation

$\mathbf{q}(\mathbf{x})$

MIPS

$\mathbf{d}(\mathbf{z})$

Margin-
alize

\mathbf{p}_θ