Searching for text and images by similarity:

**Human representation**
- Abdominal CT scan revealed a large left renal mass with extension into the left renal...

**Computational representation**

- **Text descriptor**
  - Find similar vectors

- **Visual descriptor (e.g. color,)**

**How to effectively distribute and combine documents for multimodal (e.g. text, images, video...) search?**

- **One server**
  - Server 1
  - Server n
  - Query distribution
  - Communication
  - Single-node retrieval

- **All servers**
  - Balanced index servers
  - Aggregator node
  - Processor node 1
  - Processor node 2
  - Processor node n

- **Relevant servers**
  - Results formatting
  - Rank aggregation

**Motivation**
- The biomedical literature is growing exponentially
- PubMed has over 22M articles with over 100M images with over 1000M descriptors (e.g. color, edges, texture information)
- How to deal with scalability challenges of multimodal search, enabling the indexing of billions of documents, with redundancy and load balancing guarantees?

**Results**
- **An effective distributed multimodal architecture**
  - Time
  - Aggregator node
  - Processor node 1
  - Processor node 2
  - Processor node n

- **Balanced distribution** on very large scale search (one billion descriptors)
- **Top precision results** on TREC Clinical Decision Support 2014 and ImageCLEF Medical 2013

**https://medical.novasearch.org**

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My research interests include multimedia information retrieval, data fusion algorithms, mainly in the medical information retrieval domain.