

Linking Video Segments to Relevant Wikipedia Content

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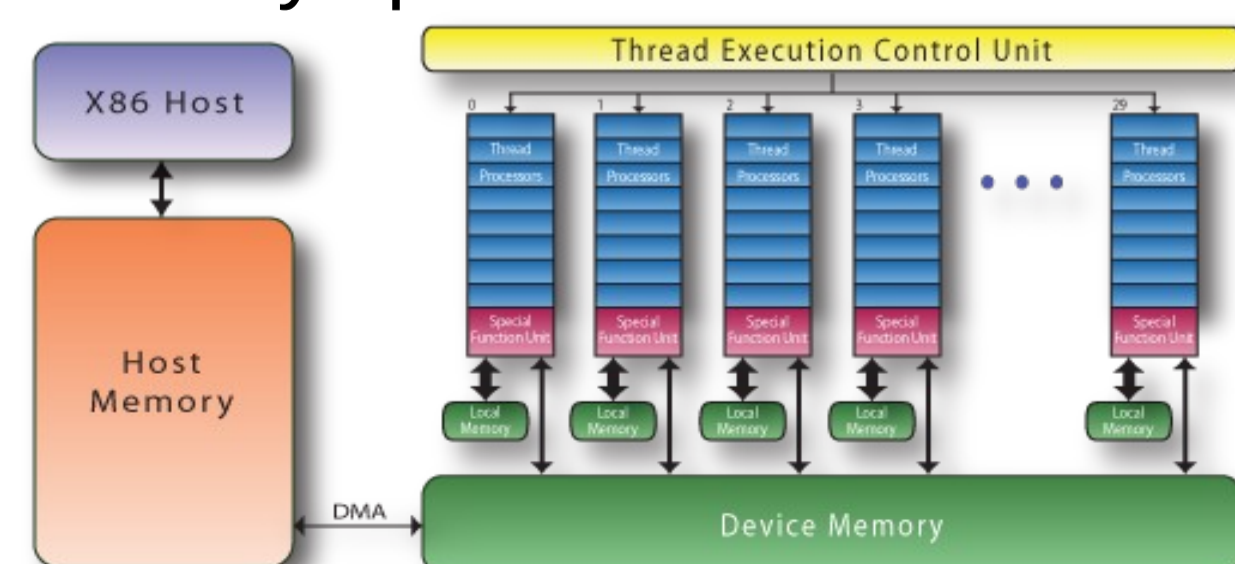
Goal: facilitate access to the BBC archive

- BBC video archive
 - ~10⁹ feet of film, ~10⁶ hours of video
 - unique content: British cultural heritage
- Mostly inaccessible to the public
 - will take 80+ years to fully digitise
 - long, monolithic programs
 - no metadata / transcripts
 - some available in analog form
- Turn archive into set of LEGO bricks
 - break programs into topically-coherent chunks
 - annotate each chunk using external resources
 - cross-link chunks by topic, flow
 - serve as enabling technology for down-stream applications
 - intelligent search and navigation over the archive
 - personalized TV programs assembled on-the-fly

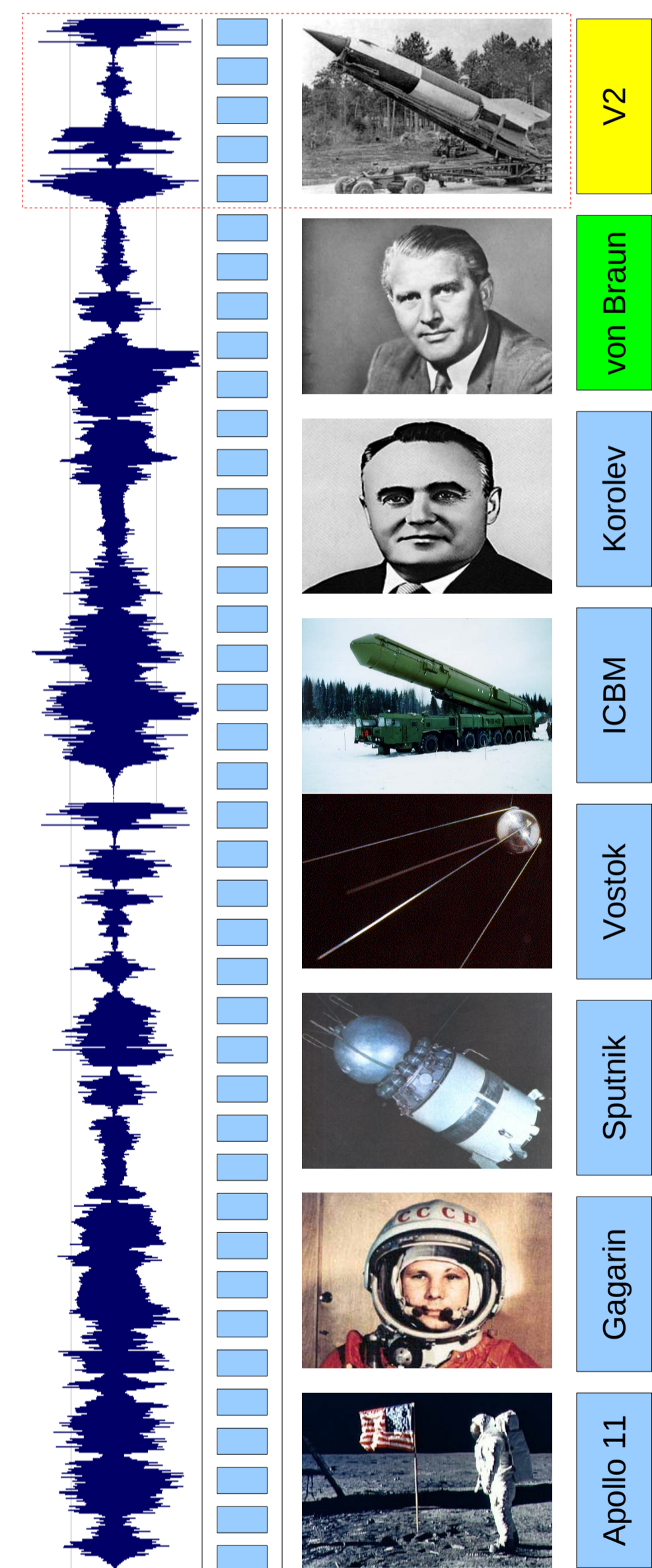


Streaming architecture

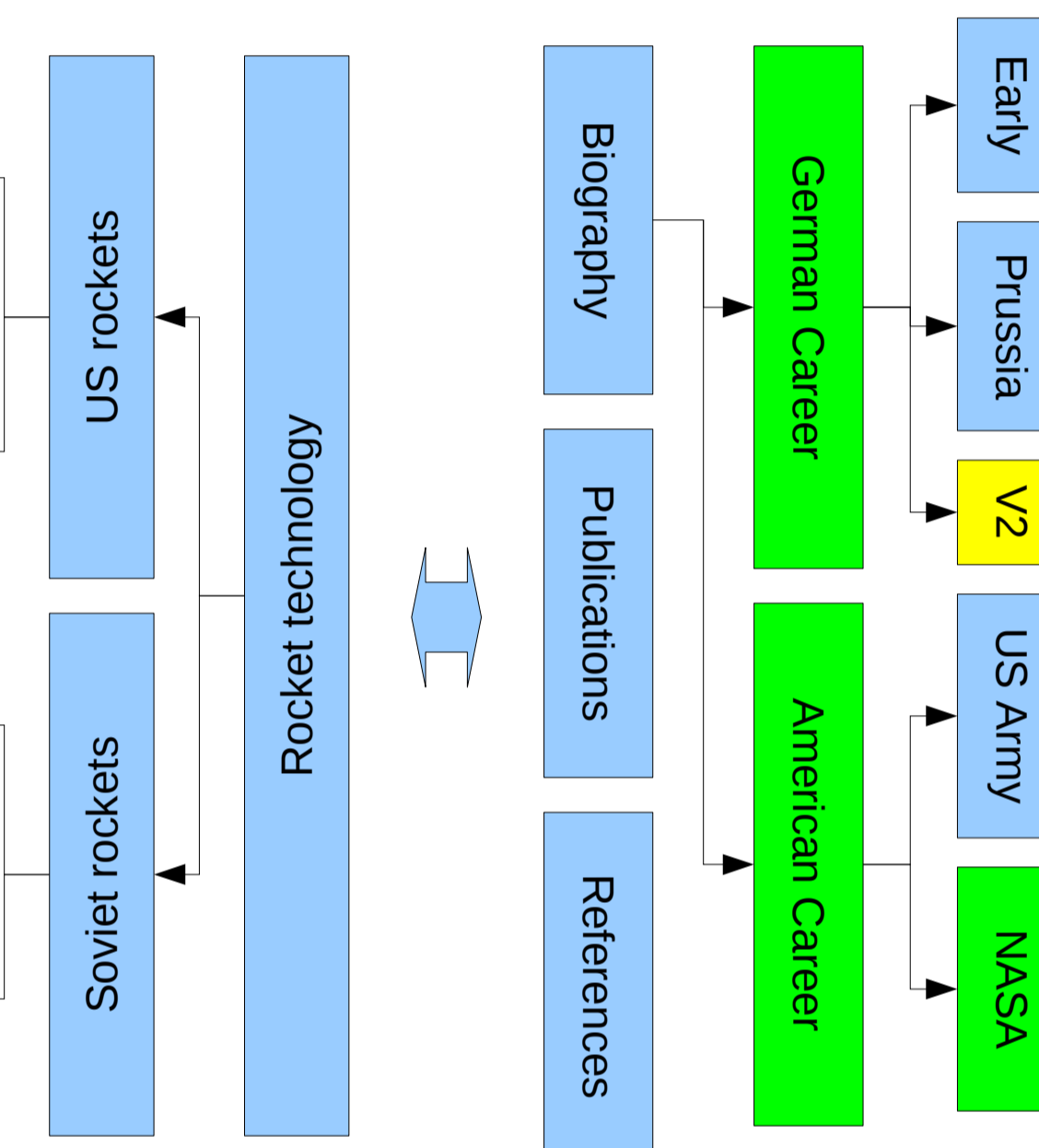
- Massive volumes of data, need low latency (on-demand)
- Computationally-intensive, but mostly space-localized
 - similarity of nearby frames
 - motion/transition detection
 - FFT on audio
 - agglomeration (adjacent)
 - matching to Wikipedia
- Good fit for a GPU: highly-parallel, limited memory



BBC Archive



Aligning Hierarchies



WIKIPEDIA

Werner Magnus Maximilian Freiherr^[1] von Braun (March 23, 1912 – June 16, 1977) was a German-American rocket physicist, astronautics engineer and space architect, becoming one of the leading figures in the development of rocket technology in Germany and the United States. Werner von Braun was said to be the preeminent rocket engineer of the 20th century.^[2] In his 20s and early 30s, von Braun was the central figure in Germany's pre-war rocket development programme, responsible for the design and realization of the deadly V-2 combat rocket during World War I. After the war, he and some of his rocket team were taken to the United States as part of the then-secret Operation Paperclip. In 1955, ten years after entering the country, von Braun became a naturalized U.S. citizen.

Von Braun worked on the American intermediate range ballistic missile (IRBM) program before joining NASA, where he served as director of NASA's Marshall Space Flight Center and the chief architect of the Saturn V launch vehicle, the superbooster that propelled the Apollo spacecraft to the Moon.^[3] In the words of NASA, he is "without doubt, the greatest rocket scientist in history. His crowning achievement ... was to lead the development of the Saturn V booster rocket that helped land the first men on the Moon in July 1969."^[4] He received the 1975 National Medal of Science.

Contents (hide)

- Biography
 - 1.1 Early life
 - 1.2 German career
 - 1.2.1 The Prussian rocketeer and working under the Nazis
 - 1.2.2 Experiments with rocket aircraft
 - 1.2.3 Slave labour
 - 1.2.4 Arrest and release by the Nazi regime
 - 1.3 Surrender to the Americans
 - 1.4 American career
 - 1.4.1 U.S. Army career
 - 1.4.2 Popular concepts for a human presence in space
 - 1.4.3 Concepts for orbital warfare
 - 1.4.4 NASA career
 - 1.4.5 Career after NASA
 - 1.5 Death
- 2 Published works
- 3 Quotations
- 4 Honors
- 5 Recognition and critique
- 6 Cultural references
 - 6.1 On film and television
 - 6.2 In print media
 - 6.3 In novels
 - 6.4 In music
 - 6.5 In computer games
- 7 See also
- 8 References

Approach

- Identify scenes using visual/audio similarity, motion
- Detect & transcribe speech, align to script (if available)
- Agglomerate into hierarchy using text, visuals, prosody
- Align with best-matching portions of Wikipedia articles
 - phonemic matching to overcome OOV errors in recognizer
 - use hierarchy for context (helps with vocabulary mismatch)

Expected Outcomes

- Interactive social platform for searching / browsing / annotating the BBC archive
- Proposal for follow-up funding for next-generation television viewing platform