



(U) Al-Hakayimah : The Face that Goes with the Voice

FROM: Adolf Cusmariu
Technical Director, Operational Technologies (S202B11)
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(S//SI) Voice-matching technology is shown to work even when the sound samples come from different collection sources.

(S) On 5 August 2006, the Qatar-based broadcaster Al-Jazeera relayed yet another audiovisual message from Al-Qaida's no. 2, Ayman Al-Zawahiri; mathematical voice comparison produced an excellent match with previous messages.

(S//SI) Noteworthy in this transmission was a bonus: four messages from one Muhammad Khalil Al-Hakayimah, an Egyptian confirming that a number of members of the Islamic Group in Egypt has decided to join al-Qa'ida.



(U) video capture of Al-Hakayimah

(S//SI) More detail may be found at:

[Al-Zawahiri/Al-Hakayimah video review](#)

...courtesy of ██████████ of S202A3. The prospect of matching any available SIGINT with the "bonus" was realized quickly; the Egyptian -- known as Abu-Jihad al-Misri -- had indeed been a collection target. Five intercepts containing his confirmed voice (analysis by ██████████ of S2I05) were provided in short order.

(S//SI) Voice matching experiments turned out well; however, one SIGINT intercept had channel fidelity issues (i.e., clipping) and MIT's algorithm failed; channel mismatch has been a resilient source of errors in mathematical voice matching. Of course, humans are more adept at detecting similarities or differences despite degradation. Still, the other four SIGINT voice files matched the Al-Jazeera transmitted voice exceedingly well.

(S//SI) To ensure robustness, experiments were also performed among the SIGINT intercepts themselves, involving ten pairings; tests proved the voices were statistically the same. Next, composite models were built from the SIGINT, including and excluding the clipped intercept. Once again, the match with open source was excellent.

(S//SI) Bottom line: SIGINT and Open Source audio can yield consistent results in voice-match tests despite collection differences.

(S) For background info on voice-matching technology, see the article [Technology that Identifies People by the Sound of Their Voice](#).

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