

AFRL RESEARCH TOPIC CALL 2009

1. **Research Title:** "Selective Compression of Archives: Largely Preserving Episodic Legacy (SCALPEL)"
2. **Individual Sponsor:** Dr. Michael L. Talbert,
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3. **Academic Area/Field and Education Level:** Electrical Engineering, Computer Science (Ph.D)
4. **Objectives:** Define scalable compression methods for petabyte archives of Wide Area Motion Imagery data.
5. **Description:** We ultimately seek a video scene indexing capability to support rapid exploitation of archived video. For the present effort, we desire a set of scalable compression techniques for ~1Hz Wide Area Motion Imagery (WAMI) video sequences. Two competing research goals are to be addressed. 1) Substantially reduce the storage footprint of petabyte-scale archives of WAMI data, and 2) preserve in sufficient resolution for basic exploitation (tracking, geo-location, event-detection) the pixel regions within and across WAMI frames which bound activity episodes. Researcher should propose, demonstrate, and evaluate the application of existing image processing and compression techniques to select candidate pixel regions for least-loss compression (episode preservation), while providing substantial compression of exploit-neutral pixel regions. Scalability may be influenced by resolution of imagery, scene dynamics, or researcher-proposed factors.
6. **Research Classification/Restrictions:** This research is FOUO and has ITAR restrictions, but can be conducted at an unclassified or classified level depending on the clearance of the researcher(s).
7. **Type of Student Desired:**
AFIT EE/CS doctoral student-team with SECRET clearance. DAGSI doctoral student-team (U.S. citizen).
8. **Eligible Research Institutions:** *Place an X in all that apply.*

Universities (DAGSI & AFIT)

AFIT (only)

USAFA