



OSAC Research Needs Assessment Form

Title of research need: Potential for reducing bias in fire and explosion investigations

Keywords: Fire, sequential unmasking, bias

Submitting subcommittee(s): Fire/explosion investigation **Date Approved:** 1/28/16

(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:

1. Description of research need:

Bias from domain irrelevant data has the potential to cause errors in the scientific determination of origin and cause. Separating the duties of examining the physical evidence and credible eyewitness statements from the law enforcement functions of identifying suspects and motives and other data not relevant to determination of origin and cause has the potential to eliminate some of this bias. Effectiveness of methods and protocols to reduce bias should be evaluated.

2. Key bibliographic references relating to this research need:

-Tversky, A., & Kahneman, O. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185, 1124- 1131. <http://dx.doi.org/10.1126/science.185.4157.1124>

-Lentini, J., (2008). "Toward a More Scientific Determination: Minimizing Expectation Bias in Fire Investigations," Proceedings of the 3rd International Symposium on Fire Investigations Science and Technology, (ISFI), NAFI, Sarasota, FL.

-Avato, S, Cox, A (2009). Science and Circumstance: Key Components in Fire Investigations. *Fire and Arson Investigator*, 59(4) 47-49.

-Dror, I.E. (2013) Practical solutions to cognitive and human factor challenges in forensic science. *Forensic Science Policy & Management* 4, 1-9.

-NFPA 921 (2014). Guide for Fire and Explosion Investigations. NFPA: Quincy, MA.

-Forensic Science Regulator (2015). Cognitive Bias effects relevant to forensic science examinations. FSR-G-217. Retrieved on January 28, 2016, from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/470549/FSR-G-217_Cognitive_bias_appendix.pdf

3a. In what ways would the research results improve current laboratory capabilities?

NFPA 921 recognizes bias as an issue, but additional research in methodology for reducing bias would be beneficial for the document and the profession.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

The research would provide the scientific underpinnings to the subcommittee to allow a credible proposal to be submitted to the NFPA 921 technical committee to enhance a future edition of that document.

3c. In what ways would the research results improve services to the criminal justice system?

Previous examples in fire investigations have led to erroneous conclusions and convictions owing to bias (*Texas v. Willingham*; *Texas v. Willis*). In at least one documented case, protecting the scene investigator from domain irrelevant data by using a second investigator to manage the investigation was shown to eliminate any challenge of the expert based on bias (*NV v. Valerie Moore*).

4. Status assessment (I, II, III, or IV):

I

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Subcommittee

Approval date: 1/28/2016

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SAC

1. Does the SAC agree with the research need? Yes No

2. Does the SAC agree with the status assessment? Yes No

If no, what is the status assessment of the SAC:

Approval date: 5/6/2016

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)