Cognitive and Human Factors in Forensic Decision Making
Workshop Description

The workshop focuses on improving Forensic Decision Making, and is tailored to the specific participants. It covers brain and cognitive issues relating to cognitive and human factors issues in decision making. It then connects the cognitive science issues to practical and specific issues in forensic work. In addition to knowledge about the cognitive and human factors in forensic decision making, the program also provides practical solutions to address weaknesses as well as best practices to enhance forensic practices.

This workshop is directly relevant to documents adopted by the U.S. National Commission on Forensic Science (NCFS), as well as the National Academy of Sciences report on forensic science. The practical implementation of the NCFS document (“Ensuring That Forensic Analysis Is Based Upon Task-Relevant Information”) is presented and discussed, as are the recommendations of the National Academy of Sciences, as well as OSAC/NIST/DOJ.

Below, we specify: Background, Intended Audience, Learning Objectives, Course Outline, Delivery of the training workshop, Dates, and Costs.

Background
Conducting forensic work (from collecting evidence at the crime scene, to its examination in the crime lab) is similar to other expert domains that require perception and interpretation of information, such as in the military, medical, and financial domains. Information is perceived, encoded, represented, transformed, stored, retrieved, compared to other information, evaluated and assessed, to name just a few cognitive processes. The human mind is not a camera, as we actively process and compare information. It is naïve to think that we passively process information, and perceive the data as ‘it really is’.

We engage in a variety of cognitive processes that organize and structure the information as it comes in from the external world. Information is then further interpreted and processed in ways that highly depend on the human mind and cognitive factors. As we dynamically process information, we affect what we see, how we interpret and evaluate it, and our decision making process. Thus, to enhance expert performance and understand that different factors may affect decision making, especially in a highly specialized domain such as forensic science, one needs to take into account the role of the human mind and cognitive factors (Dror, 2015).
Although training is provided to forensic experts, there is a lack of training in psychological and cognitive factors involved in forensic decision making. Thus, there is a lack of systematic training and professional development in the influence of human cognition on forensic work and this workshop is a step towards addressing training in the cognitive and human factors involved in forensic decision making.

**Intended Audience**
This workshop can be tailored to CSI, forensic examiners, forensic reporting officers, expert witnesses, QA or supervisors/managers across the forensic science domains. This training program is appropriate for beginner, intermediate, and advanced level staff.

**Learning Objectives**
- Describe background information regarding the human mind and cognitive system
- Describe how information and knowledge are acquired, processed, represented, encoded, stored, utilized, retrieved, compared, and evaluated
- Describe how decisions are made
- Demonstrate the connection between contextual information and a variety of forensic decision making processes that forensic examiners typically use
- Describe how cognitive factors can be utilized to make forensic experts' work more efficient
- Describe the pitfalls and errors that can occur in forensic decision making.

**Course Outline**
No prior knowledge in cognition is required. This program covers a variety of issues specifically chosen as relevant to enhance the work of forensic examiners and will be tailored to the specific participants taking part in the workshop. Three primary areas are covered: 1. Background knowledge, 2. Domain applications, and 3. Domain implications.

**Background Knowledge**
Background knowledge will cover general principles and mechanisms of the human mind and cognition as they relate to decision making, such as:
- a. The human brain and how that translates to human performance and how we process information.
- b. How information processing underlies all aspects of perception and cognition in general and in expertise.
- c. The Hierarchy of Expert Performance (HEP)
- d. Specific issues in information processing, such as: knowledge representation, allocation of resources, perception, judgment and decision making.
e. Architectural constraints in cognition, including: limits in information processing load, malfunctions, and lack of control.

**Domain Applications**

Domain Applications will connect the Background Knowledge to a variety of forensic decision making issues, such as:

- Cognitive perseverance
- Confirmation bias, snowball bias, and cascade bias
- Self-fulfilling prophecies
- Contextual influences
- Cognitive closure and dissonance
- Expertise
- Escalation of commitment

**Domain Implications**

Domain Implications will tie both Background Knowledge and Domain Applications to specific issues regarding how forensic decision making is conducted.

In addition to specific ways to enhance forensic decision making, this course will try to provide more in-depth tools to the participants. Such tools will accompany the participants in the future and will enable them to enhance and enrich their professional abilities. This part will also include discussion of court cases that were challenging and highlighted cognitive factors in forensic decision making. The recent National Commission on Forensic Science’s document on “Ensuring That Forensic Analysis Is Based Upon Task Relevant Information” and other recent developments in OSAC, NIST, and DoJ will be discussed and integrated into the course.

A variety of practical solutions will be presented and discussed, such as LSU, compartmentalization, case managers, TIP, and these (as well as others) will be presented within forensic information related to the case, reference materials, contextual information, base rate data, training, motivation and experience.

**Delivery of the training workshop**

A workshop of this sort is quite different from the typical training provided to forensic examiners, and to deliver this workshop it is critical that it will be provided by an instructor that:

1. Has deep understanding and insights to the working of the human brain and cognitive system. A workshop on ‘Cognitive Factors’ and ‘Decision Making’ cannot be delivered by someone who does not have years of experience, research and publications on the human brain and how it functions.
2. Has specific and practical knowledge of forensic work, and has been working specifically in the area of bias and cognitive issues within the forensic domain.
3. Has specific experience and a proven track record in successfully providing such workshops.
The CCI-HQ workshop delivered by Dr. Dror meets all of these three critical elements:

1. Dr. Itiel Dror, who will be providing this workshop, is a cognitive neuroscientist who received his Ph.D. in Harvard (1994) in the area of cognitive factors in human expert performance. Since his Ph.D. over twenty years ago, Dr. Dror has been researching this area, and has published over 100 peer-reviewed articles specifically looking at cognitive factors that mediate human expert performance. His insights and understanding of the human brain and cognitive system underpin the workshop. Without such deep knowledge, it is not possible to properly deliver a workshop on the ‘cognitive factors’ and ‘decision making’.

2. Dr. Dror has been working in the forensic domain for over a decade. In fact, he is the person who introduced the human and cognitive factors to the forensic community and has made this issue central in forensic science. Over the last decade Dr. Dror has worked with a variety of forensic laboratories across the US, in which he has visited and shadowed examiners doing casework, reviewed SOPs and practices. Dr. Dror was the Chair of the OSAC Human Factor group, which is responsible for the cognitive factor issues across all the OSAC forensic domains. The National Commission on Forensic Science has recognized Dr. Dror as the leader in this area and has asked him to present to the commission and appointed him to their Human Factors subcommittee. He was invited to present (as well as cited by) the National Academy of Science report on forensic science (NAS, 2009), and the President’s Council of Advisors on Science & Technology report on forensic science (PCAST, 2016). Dr. Dror has also been working with many other forensic bodies and has many more credentials in this area (a full 57-page CV is available). The recommendations on cognitive and human factors of the NCFS and the NAS report, and other bodies are mainly based on the research and work conducted by Dr. Dror.

3. Dr. Itiel Dror has a proven track record in successfully delivering workshops, specifically on ‘Cognitive and Human Factors in Forensic Decision Making’, to dozens of forensic laboratories (not counting the numerous conference presentations on this topic). He is the person who has the combined cognitive and forensic expertise to deliver this training. His workshops on this specific issue have been delivered with great success to the FBI, NYPD, LAPD, San Francisco PD, Kansas PD, Boston PD, and many other forensic laboratories across the US. As the world leader in this area, Dr. Dror has also been commissioned to deliver this workshop in a variety of countries across the world (Australia, Finland, the Netherlands, Italy, Canada, Brazil, Taiwan, as well as other countries –not to mention numerous police forces the United Kingdom).

The success of his workshops and his training in this area has been recognized by the professional bodies: Dr. Dror has received the ABP Annual Award for 'Excellence in Training' for his workshops on cognitive and human factors in forensic decision making. The purpose of the award is to recognize...
excellence in demonstrating how applying an understanding of the science of human behavior can impact and deliver practical value to organizations. The judges commented that Dr. Dror's workshops are: "Truly outstanding and inspiring", "A highly rigorous application of relevant theoretical frameworks", "Truly innovative, breaking entirely new ground in a most challenging context", "Internationally ground-breaking impact - already being used around the world", "Entirely focused on application of conceptual models – underpinned by deep research", and "Impact is highly impressive".

More information is available at: http://www.cci-hq.com/forensic-identification.html