

Unfamiliar Face Matching Research Meeting

Theory and Practice In Unfamiliar Face Identification



CONFERENCE



UNSW
AUSTRALIA

PROGRAM

Tuesday - Wednesday
17-18 February

2015

Introduction

Welcome to the Unfamiliar Face Matching Research Meeting 2015.

The Unfamiliar Face Matching Research Meeting is a forum focusing on both theoretical and applied aspects of unfamiliar face matching. It provides an opportunity to bring together users and developers of Automatic Face Recognition software, with researchers interested in the performance of the human operators working with these systems, and lawyers interested in the legal implications of this technology. This work is of both academic interest to researchers in the field of face recognition and of practical significance to those who use these systems to identify customers, passengers, citizens or offenders.

The meeting is designed to provide an informal setting where the latest research findings can be revealed in brief and accessible presentations, followed by wide ranging discussions of the practical, legal and theoretical implications of the work.

In the last few years Australia has emerged as a world-leader in this type of applied face processing research. We hope that this meeting will provide the opportunity for everyone to contribute to the continued success of the collaborative work that has been taking place in this field.

Richard Kemp, David White & James Dunn

February 2015



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<i>9:00am - 12.30pm</i>	
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Tuesday, 17 February 2015

Title	Topic	Presenter
9.30am Introductions		
Session 1 UNSW Law Building, Ground Floor, G02		
10.00 - 10.05am	Introduction	Richard Kemp
10.05 - 10.15am	Establishing visual expertise	Jason Tangen
10.15 - 10.25am	Discussion	
10.25 - 10.45am	Image comparison evidence in Australian courts: an update	Gary Edmond & Mehera San Roque
10.45 - 10.55am	Discussion	
10.55 - 11.05am	Protecting courts against bad science: do legal safeguards moderate the impact of poor quality evidence in cases involving identification from CCTV?	Helen Dimitrios
11.05 - 11.15am	Discussion	
11.15 - 11.50am Morning break		
Session 2 UNSW Law Building, Ground Floor, G02		
11.50 - 12.00pm	Fake it 'til you make it: Investigating prevalence of fake ID users and their perceptions of face matching accuracy	James Dunn
12.00 - 12.10pm	Discussion	
12.10 - 12.20pm	Metacognitive abilities in facial image comparison	David White
12.20 - 12.30pm	Discussion	
12.30 - 12.40pm	Bias inflates belief: Perceptions of video-recorded identification procedures	Jennifer Beaudry
12.40 - 12.50pm	Discussion	
12.50 - 1.00pm	Who are you expecting? Biases in face perception reveal prior expectations for sex and age	Colin Clifford
1.00 - 1.10pm	Discussion	
1.10 - 2.10pm Lunch		
Session 3 UNSW Law Building, Ground Floor, G02		
2.10 - 2.20pm	Is facial identification training effective?	Alice Towler
2.20 - 2.30pm	Discussion	
2.30 - 2.40pm	Development of Australian national standards for training and competencies for facial comparison	Patricia Moss
2.40 - 2.50pm	Discussion	
2.50 - 3.00pm	Training visual expertise	Rachel Searston
3.00 - 3.10pm	Discussion	
3.10 - 3.20pm	Experiapp: Evolution of an unfamiliar face testing system	Andrew Burr
3.20 - 3.30pm	Discussion	
3.30 - 4.00pm Afternoon break		
Session 4 UNSW Law Building, Ground Floor, G02		
4.00 - 4.10pm	Communicating visual expertise	Matthew Thompson
4.10 - 4.20pm	Discussion	
4.20 - 4.30pm	Understanding the relationship between voice and face matching ability	Tanya Wayne
4.30 - 4.40pm	Discussion	
4.40 - 4.50pm	Differences in computer and human vision: an opportunity to improve operational accuracy of face recognition systems	Abbas Bigdeli
4.50 - 5.00pm	Discussion	
5.00 - 5.30pm General discussion		
6.00pm Dinner at Whitehouse UNSW (**Must RSVP beforehand to attend**)		

Roundtable Meeting

**Wednesday, 18 February 2015
UNSW, Law Building, Ground Floor, Room G02**

Session 1: 9 - 10:30am
Session Chair: David White

Session 2: 11 - 12.30pm
Session Chair: Richard Kemp

Topics include:

- Practical solutions based on research
- Review of limited success of FR algorithms
- How humans and algorithms differ in face processing?
- Industry driven questions for research?
- The optimal resolution for automated and manual FR?
- Research collaborations

Abstracts: Session 1

ESTABLISHING VISUAL EXPERTISE

Jason M. Tangen

School of Psychology, University of Queensland

There are experts in many different subject areas. The job of an expert is to classify a variety of stimuli as examples of the same thing. They see an unknown thing, and draw on their previous experience to decide which category it belongs to (e.g., Species A vs. Species B, Normal vs. Abnormal, Jones vs. Smith). As a novice becomes an expert, one must accumulate a sufficient number of experiences with specific variations of a case to put it into the correct category. Mastery of these perceptual variants is a formidable learning task, and requires considerable hands-on experience. In a series of experiments, we compared the classification performance of experts and novices and report some of the systematic differences between them. Our findings indicate that identification experts rely heavily on general pattern recognition abilities and they perform accurately when information is sparse—experts can do a lot with a little.

IMAGE COMPARISON EVIDENCE IN AUSTRALIAN COURTS: AN UPDATE

Gary Edmond & Mehera San Roque

Faculty of Law, UNSW

This presentation will review some recent decisions on image comparison evidence based on CCTV footage, including the High Court's judgment in *Honeysett v R* [2014] HCA 29. While the 'expert' evidence was held to be inadmissible in that case, the High Court avoided addressing the broader challenges raised by the defence case, including the important question of whether the admissibility criteria for expert opinion evidence ought to incorporate a reliability standard or threshold. This presentation will discuss the limitations of the High Court's decision, and consider whether their narrow approach may have unintended consequences for the admission of evidence based on image comparisons in other contexts.

PROTECTING COURTS AGAINST BAD SCIENCE: DO LEGAL SAFEGUARDS MODERATE THE IMPACT OF POOR QUALITY EXPERT EVIDENCE IN CASES INVOLVING IDENTIFICATION FROM CCTV?

Helen Dimitrios

School of Psychology, UNSW

Prosecutors sometimes rely on “facial mapping” evidence to identify an offender from CCTV images. This evidence has been criticised, but rather than excluding it many courts rely on legal safeguards to protect against undue influence of the evidence. We describe three experiments designed to assess these safeguards. Results showed that judicial warnings and limits to the language used by experts did not reduce identification errors, but the inclusion of evidence from a defence expert offered some protection to innocent defendants. Our results show that courts need to be more willing to exclude poor quality expert evidence.

Abstracts: Session 2

FAKE IT ‘TIL YOU MAKE IT: INVESTIGATING PREVALENCE OF FAKE ID USERS AND THEIR PERCEPTIONS OF FACE MATCHING ACCURACY

James Dunn, David White & Richard Kemp

School of Psychology, UNSW

Previous evidence suggests that the use of fake photo-ID documents is prevalent among underage youths. The success of this approach relies on a failure of unfamiliar face matching, which may cause users to be particularly aware of its difficulty. In two studies across separate populations: Australian undergraduate students and online American participants, we sought to investigate fake ID use and what impact, if any, fake ID use had on the perceptions and face matching ability of users. We confirmed that fake ID use is high, with ~15% of respondents admitting to using one while underage and with of these 70% using another person’s legitimate ID. Common uses of the ID include: accessing age-restricted venues, such as night clubs, and purchasing prohibited goods, such as alcohol. Finally, compared to non-users, fake ID users had a skeptical view of face matching, believing others to be worse at face matching and that fake IDs are less likely to be detected.

METACOGNITIVE ABILITIES IN FACIAL IMAGE COMPARISON

David White, James Dunn & Richard Kemp

School of Psychology, UNSW

People are surprisingly poor at matching photographs of unfamiliar faces. Confounding this problem, participants' confidence does not predict their accuracy, and so people are generally unaware of their poor performance. Here we summarise recent work focusing on two measures of 'metacognitive' ability in face matching. First, we measure sensitivity of confidence judgments in predicting accuracy of identity judgments. We find that metacognitive accuracy is close to chance and does not appear to be a stable individual difference. Second, we test participants' ability to select images that support identification performance. Participants were unable to select images that benefited identification accuracy, when the appearance of the comparison image is unknown. Thus, for images captured in uncontrolled environments, assessments of image quality may not predict matching accuracy. We discuss implications for face identification in forensic and security settings, and the potential for forensic training to improve these abilities.

BIAS INFLATES BELIEF: PERCEPTIONS OF VIDEO-RECORDED IDENTIFICATION PROCEDURES

Jennifer L. Beaudry¹, James D. Sauer², Gabrielle Blanksby¹

¹Swinburne University of Technology, ²University of Tasmania

In the search to find ways to improve people's discrimination between accurate and inaccurate eyewitness identifications some researchers recommend presenting a video record of the identification procedure in court. Although this may increase discrimination when best-practice procedures are used, little is known about how people interpret evidence obtained from suggestive procedures. Participants ($N = 53$) viewed eight genuine eyewitness identifications (four accurate, four inaccurate) obtained under double-blind or extremely biased (combined foil, clothing, and instruction biases) administration conditions. Evaluators rated the biased procedures as significantly more suggestive than the double-blind procedures. Participants discriminated between accurate and inaccurate double-blind identifications. When exposed to identifications from the biased procedure, belief increased more for inaccurate than accurate eyewitnesses. Thus, despite showing sensitivity to biases, viewing the suggestive procedure reduced evaluators' discrimination by making mistaken eyewitness identifications seem accurate.

WHO ARE YOU EXPECTING? BIASES IN FACE PERCEPTION REVEAL PRIOR EXPECTATIONS FOR SEX AND AGE

Colin Walter Giles Clifford¹, Tamara Lea Watson² & Yumiko Otsuka¹

¹*School of Psychology, UNSW; ²School of Social Science and Psychology, University of Western Sydney*

When we look at another person what do we expect to see? And what role do those expectations play in the processing of our sensory input and in determining what we perceive? Here, we use Bayesian modelling methods to establish the origin of biases in our perception of key aspects of an individual's identity when viewing a face: age and sex. Our results reveal a perceptual bias for male and older faces that is evident under conditions of uncertainty, dissociated from an own age assimilation effect that appears to be cognitive in origin. The perceptual nature of the male and older age bias represents a true inaccuracy in perception that is particularly evident under conditions of uncertainty: when in doubt, faces actually look older and more masculine. These findings will have implications for anyone required to make accurate judgments of the characteristics of people based on their facial appearance.

Abstracts: Session 3

IS FACIAL IDENTIFICATION TRAINING EFFECTIVE?

Alice Towler

School of Psychology, UNSW

Establishing the identity of an unfamiliar person is critical in security situations such as at border crossings and in forensic investigations. However, human performance on this task is highly error-prone, with errors made on 20-30% of occasions. To mitigate risk, staff in these roles undergo training to improve their face matching accuracy. Here we present the first systematic validation of these training methods. Results show that current training does not improve accuracy in unfamiliar face matching tasks. Encouragingly, subsequent studies based on our understanding of face processing have identified training methods that produce reliable improvements in identification decisions. Our findings emphasise the need for professional organisations to adopt evidence-based training procedures.

DEVELOPMENT OF AUSTRALIAN NATIONAL STANDARDS FOR TRAINING AND COMPETENCIES IN FACIAL COMPARISON

Patricia Moss

Australian Passport Office, Department of Foreign Affairs and Trade

A standard national training program is being developed across 3 commonwealth agencies under the National Identity Security Strategy. This presentation will discuss its' development as it currently stands.

TRAINING VISUAL EXPERTISE

Rachel A. Searston

School of Psychology, University of Queensland

In everyday identification tasks (e.g., recognising a friend in a photograph), we are able to identify new instances of an individual by drawing on a vast repository of previous encounters. Similarly, in everyday classification tasks (e.g., recognising a bird as a lorikeet), we are able to identify new members of a category by relying on a rich bank of prior experience with other members. But in professional identification domains, such as fingerprint and unfamiliar face matching, examiners don't have thousands of prior instances of a person's photograph or thumb print when deciding whether (or not) a second photograph or thumb print is another instance of the same person. How do people learn to identify new instances of an individual, with only one other encounter to reference? Using fingerprint identification as a test bed, we show that feedback, contrasting examples, and elaboration are three ways to train visual discrimination expertise.

EXPERIAPP: EVOLUTION OF AN UNFAMILIAR FACE TESTING SYSTEM

Andrew Burr

The Westbourne Group

How does one determine which individuals are consistently 'good' at identifying faces, particularly in an operational context? This is the core question behind an ongoing project to develop an unfamiliar face aptitude testing system. This project aims to develop an application which addresses three key areas of interest in operational and research domains: the facilitation of unfamiliar face experiments, particularly where access to experts is constrained by geography; development of a platform for aptitude testing; and enabling processes for ongoing training and practice. This presentation will discuss the progress of the project for the previous twelve months, with an overview of the project's direction for the coming year.

Abstracts: Session 4

COMMUNICATING VISUAL EXPERTISE

Matthew B. Thompson

School of Psychology, University of Queensland

Data on the performance and accuracy of identification experts is growing. We now have a clearer picture of the factors that affect the performance of forensic examiners, medical doctors, and face specialists. Less clear, is how to communicate this visual expertise to non-experts. These experts are often asked to explain the basis of their decisions in courtrooms, hospitals, and security arenas, but we don't know what's most effective for understanding. These experts must also impart their expertise to novices, but we don't know what's most effective for training. Here we propose a diagnostic framework for the interpretation and expression of comparison evidence, and a program of research to reveal the visual features that experts actually use when making safety-critical decisions.

UNDERSTANDING THE RELATIONSHIP BETWEEN VOICE AND FACE MATCHING

ABILITY

Tanya Wayne

School of Psychology, UNSW

While we often identify people by their face, sometimes this information is not available, such as over the phone. In this case, the voice, another rich source of identity information, becomes the primary method of identification. Although both face and voice can be used to identify a person, the relationship between these factors is not fully understood, with arguments for both shared and independent processing. The nature of this relationship is of theoretical and practical importance. In order to examine if and how voice and face processing are integrated, we looked at the relationship between performances on voice- and face-matching tasks. Participants completed each of these tasks twice, in two sessions separated by a week. The relationship and stability of performance, sensitivity, bias and metacognitive ability was examined. Our results suggest that voice- and face-matching are not related abilities, and that the ability to perform voice comparison may not be stable.

DIFFERENCES IN COMPUTER AND HUMAN VISION: AN OPPORTUNITY TO

IMPROVE OPERATIONAL ACCURACY OF FACE RECOGNITION

Abbas Bigdeli¹, Farhad Dadgostar¹, Richard Kemp² & David White²

¹Aervision Technologies Pty Ltd., ²School of Psychology, UNSW

Previous studies show that match scores generated by humans and automatic face recognition software (FR) are uncorrelated. Thus, faces that appear similar to humans are not judged as similar by face recognition algorithms, and vice versa. This divergence is a good thing in the context of human-computer interaction, entailing that errors made by humans and computers are also uncorrelated. Thus, statistically combining (or ‘fusing’) human and computer match scores produces large gains in accuracy of FR systems. In this talk we present a novel approach to this fusion problem that involves combining human and computer decision making at the feature level. In addition to optimising fusion of human and machine vision, our collaborative project has the potential to identify features associated with human error in face matching, optimise presentation of faces in the user interface and to generate training materials for FR users.

Meeting Organisers

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Notes

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