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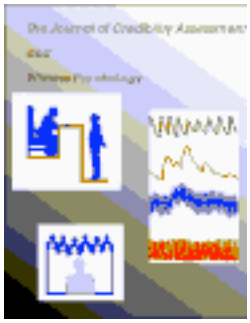

# The Gaze Control System and Detection of Deception

**John A. Stern**

**Washington University, St. Louis, Missouri**

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# The Gaze Control System and Detection of Deception

- Camera based systems allow for relatively unobtrusive recording of:
- Oculomotor activity
  - Eyeball movement
  - Eyelid movement
  - Pupil diameter changes
  - Minor head movement
  - Vergence eye movements

- Which components may be useful in the detection of deception?
- I will start with the one with highest probability of pay-off.
- (my guesstimate – and I may be wrong)

1. Pupil diameter change – highest likelihood of immediate payoff:
   - Reasonable literature in support of this measure.
   - Most recent – report from Technion on guilty knowledge test (2004).
   - Innocent found innocent 90%.
   - Innocent found guilty 10%.
   - Guilty found guilty 75%.
   - Guilty found innocent 25%.
   - Question: 1. What can it contribute to current polygraph measures? 2. What can it contribute to non-polygraph based investigations?

2. Eye movements – saccades
   - Saccades move gaze to location of interest
   - Timing of saccade with respect to "information" presentation.
   - Speed with which gaze shifts to location of interest.
   - CLEM – suggestive of information processing style- does operator have to think about answer before responding?
     - Do left movers use strategies different from right movers when attempting to be deceptive?

3. Head movement – minor movements.
   - If task is "difficult" likelihood of head movements is enhanced. Is lying more difficult than truth telling?
   - Timing of head movement with respect to eye movement.

4. Eye blinks
   - Increase – with "anxiety" (and other variables)
   - Decrease – with difficulty of information processing task
   - Timing – with respect to eye and head movements,
   - Timing – with respect to aspects of information processing
   - Duration – discriminating between blink and lid closure

**CONCLUSION: SPECIFIC and GENERAL**

1. There is no unique oculomotor signature associated with deception
2. There is no unique "bio-behavioral signature" associated with deception
3. Deception involves both affective and cognitive components.
4. Which component is most important may be unique to the individual
5. The bio-behavioral signature may be unique to the individual but we should be able to identify parameters effective for identifying deception for a specific subject.

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