DEMONSTRATOR FOR EXTRACTING COGNITIVE LOAD FROM PUPIL DILATION FOR ATTENTION MANAGEMENT SERVICES

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MOTIVATION

… to explore how the flood of notifications on different computing devices and in smart environments can be managed, in order to avoid information overload …

not how or if but when!
EYE SENSING

- **Blinks**
  - Absence of Blinks can indicate **strong concentration**

- **Pupil Fixations**
  - Lower duration → **Automation of information encoding/processing**
  - Higher duration → **Larger information gain** per fixation

- **Saccades**
  - Experts are repeatedly making **short saccades**
  - Experts show a more **structured scan path** than novices

- **Pupil Dilation (Task-evoked pupil response - TEPR)**
  - Pupil dilation shows correlations to the **locus coeruleus-norepinephrine system (LC-NE)** a part of the middle brain which is responsible for controlling attention.
  - The correlation with attention control expresses in impact on the **inhibition of return (IOR)**.
A MODEL FOR PUPIL RESPONSE TO EVENTS

B. Hoeks and W. J. Levelt
“Pupillary dilation as a measure of attention: A quantitative system analysis,”
Behavior Research Methods, Instruments, & Computers, vol. 25, no. 1, 1993
NON-LABORATORY PUPIL DILATATION
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NON-LABORATORY PUPIL DILATION
ALGORITHM FOR COGNITIVE LOAD DETECTION
A DEMONSTRATOR FOR COGNITIVE LOAD

Source: [https://pupil-labs.com](https://pupil-labs.com).

CONCLUSION

We can determine *when* the best time for an interrupt is and to some degree *how* this is perceived.