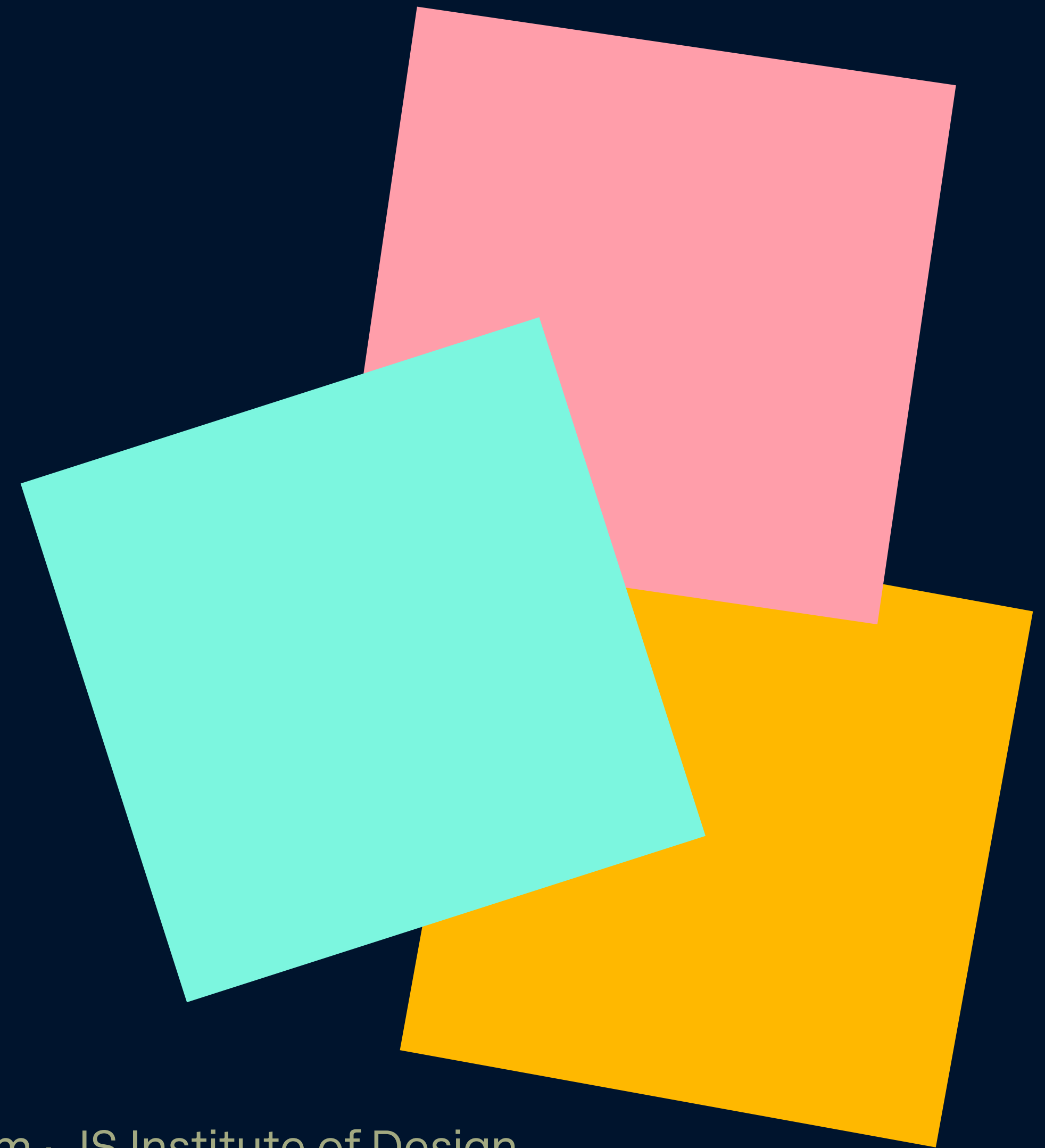


Lecture 4

Ergonomics - Physical and Cognitive

Attention



RECAP

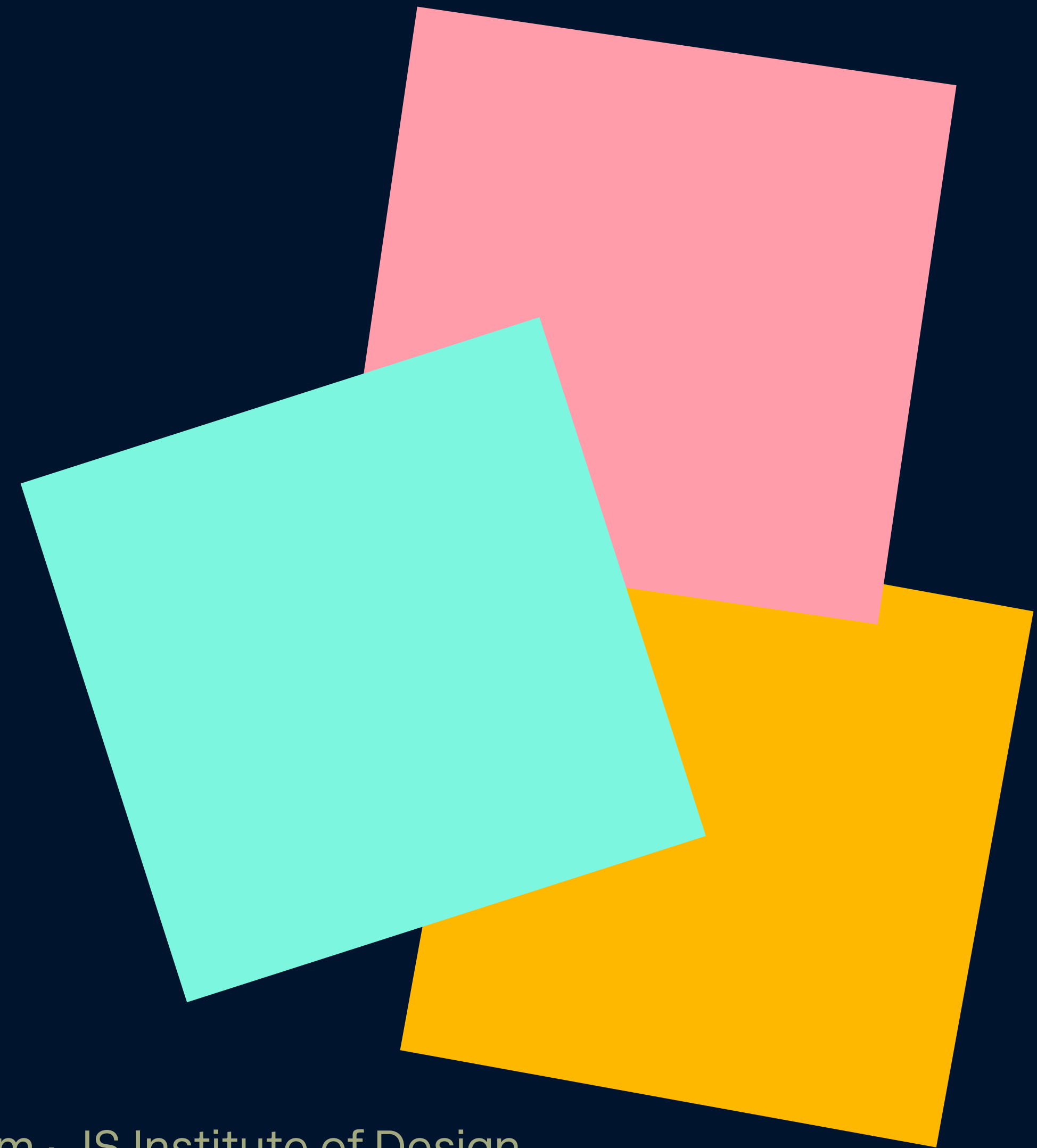
Last Friday

Lecture 3

Ergonomics - Physical and Cognitive

Cognitive Ergonomics

12 September 2025 · Gyan Lakhwani · gyanlakhwani@gmail.com · JS Institute of Design



Cognition

The mental process of acquiring knowledge and understanding through thought, experience, and the senses.

how the brain takes in, processes, and uses information to interact with the world.

It includes:

- thinking
- learning
- memory
- perception
- attention
- language
- decision-making
- problem-solving

The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information

Author(s):

George A. Miller (1956)

Source:

First published in *Psychological Review*, 63, 81-97.

The Magical Number Seven, Plus or Minus Two: Some Limits on our Capacity for Processing Information[\[1\]](#)

George A. Miller (1956)

Harvard University

First published in *Psychological Review*, 63, 81-97.

My problem is that I have been persecuted by an integer. For seven years this number has followed me around, has intruded in my most private data, and has assaulted me from the pages of our most public journals. This number assumes a variety of disguises, being sometimes a little larger and sometimes a little smaller than usual, but never changing so much as to be unrecognizable. The persistence with which this number plagues me is far more than a random accident. There is, to quote a famous senator, a design behind it, some pattern governing its appearances. Either there really is something unusual about the number or else I am suffering from delusions of persecution.

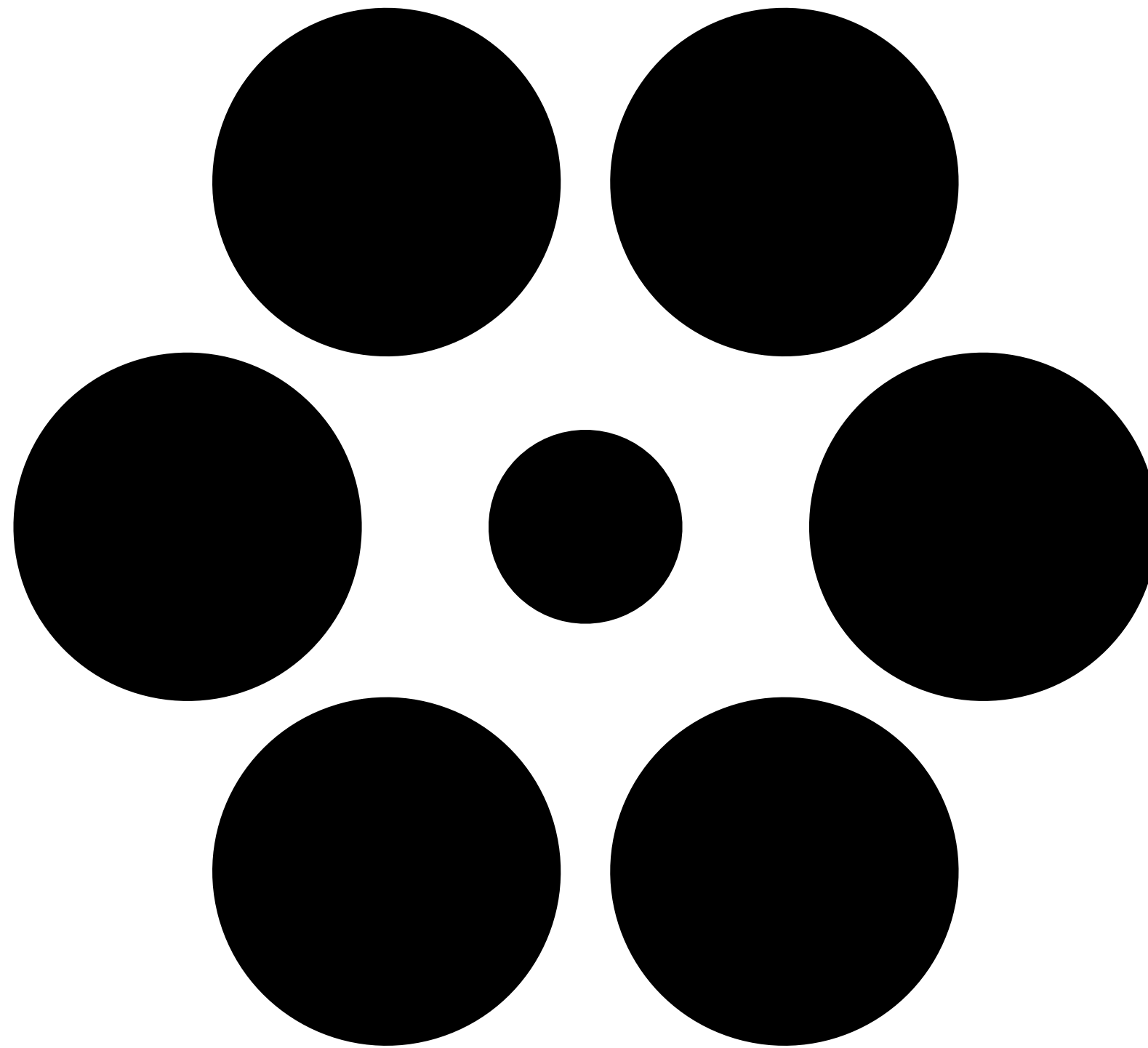
I shall begin my case history by telling you about some experiments that tested how accurately people can assign numbers to the magnitudes of various aspects of a stimulus. In the traditional language of psychology these would be called experiments in absolute judgment. Historical accident, however, has decreed that they should have another name. We now call them experiments on the capacity of people to transmit information. Since these experiments would not have been done without the appearance of information theory on the psychological scene, and since the results are analyzed in terms of the concepts of information theory, I shall have to preface my discussion with a few remarks about this theory.

Information Measurement

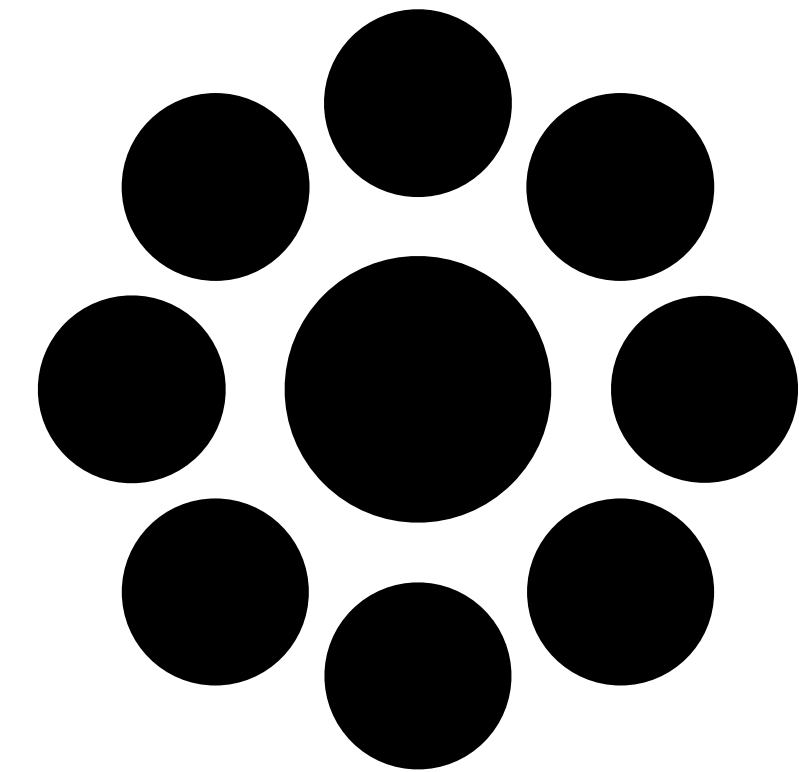


Visual Perception

**Which inner
circle is
bigger?**



Circle A



Circle B



Visual Perception

Gestalt Principles

Gestalt Principles

How do we see?

- We don't view in a fixed order
- We see first what stands out
- We see only a few things at once
- We seek meaning and make connections
- We rely on conventions and metaphors

Attention



Perception



Memory



Sense-making

**Once something is
perceived, the next
challenge is remembering
and making sense of it**



Cognitive Ergonomics

Attention

Have you ever been told
PAY ATTENTION
TO THIS!



Have you ever been told
PAY ATTENTION
TO THIS!

What does that actually mean?



Humans have limited attention.

Humans have limited attention.

What have you paid attention to in
the past minute?

Humans have limited attention.

Close your eyes for 15 seconds and
try and use senses other than sight.

What can you hear, taste, smell,
feel?

Humans have limited attention.

We ignore a lot of things and
focus on the parts that matter in the
moment. Why?

Attention is the cognitive process of selecting certain information while ignoring other stimuli.

Auditory perception

What sort of sounds do you perceive as pleasant?

What sort of sounds do you perceive as dangerous/
warning?

How would you design a morning alarm sound?

What should a message notification sound like?

Attention is the cognitive
process of selecting certain
information while ignoring
other stimuli.

Attention is the cognitive
process of **selecting certain**
information while ignoring
other stimuli.



You can guide attention
with an understanding of
design principles

What do we know about
ATTENTION

What do you find it difficult to pay attention to? Why?

What do we know about

ATTENTION

What do you find it difficult to pay attention to? Why?

What do you find it easy to pay attention to? Why?

What do we know about

ATTENTION

What do you find it difficult to pay attention to? Why?

What do you find it easy to pay attention to? Why?

What is your 'attention span'? For something fun? For something boring?

What do we know about

ATTENTION

What do you find it difficult to pay attention to? Why?

What do you find it easy to pay attention to? Why?

What is your 'attention span'? For something fun? For something boring?

Why do we get distracted?

Selective Attention

People focus
only on what
seems relevant

Divided Attention

Splitting
between tasks
reduces
effectiveness

Sustained Attention

Ability to
maintain focus
over time





4.1 crore warnings displayed for transactions suspected to be scams by Google Pay

Google DigiKavach Making India Safer with Google



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Horoscope Today, September 19, 2025: Karmic Lessons Unfold as Jupiter Enters Punarvasu

Neeraj Dhankher / TOI Astrology / Sep 19, 2025, 00:00 IST

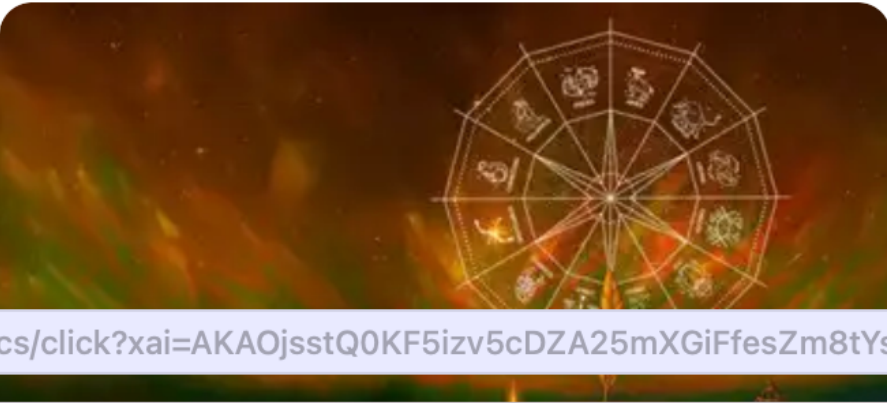
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Opportunity Knocks Again

3 BR VRV HOMES AT YAMUNA EXPRESSWAY
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#THE_WOW_LIFE

CLOSE X

Today's horoscope for September 19, 2025, offers guidance for each zodiac sign in areas like career, love, and personal growth. Aries should align actions with inner feelings, while Taurus finds strength in quiet perseverance. Gemini is encouraged to rest wi ...[Read More](#)



Start your day with clarity! Today's horoscope highlights the opportunities and challenges for each zodiac sign. Whether it's career, love, or personal

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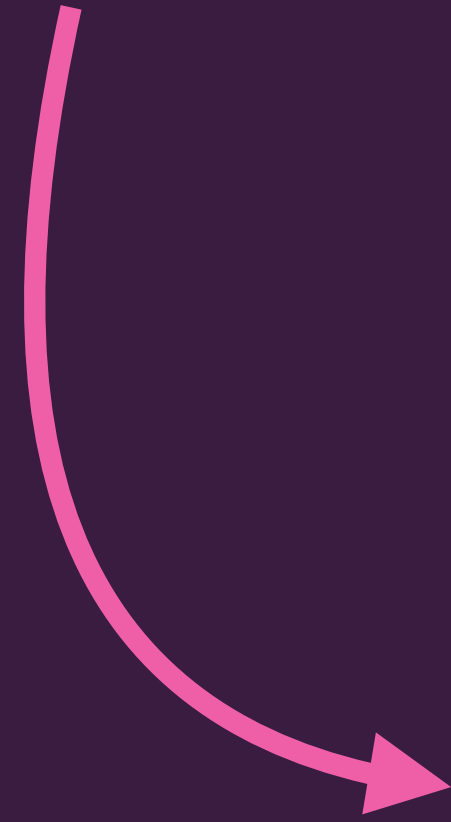
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Horoscope Today, September 19, 2025:

Daily Chinese Horoscope: September

Signal vs Noise

Stuff to pay
attention to



Signal vs Noise



Stuff to ignore

Selective Attention

People focus
only on what
seems relevant

Divided Attention

Splitting
between tasks
reduces
effectiveness

Sustained Attention

Ability to
maintain focus
over time

**You are
reading a
textbook and
your friend
sends you a
Reel. What
happens?**



Many cars do
not let you
connect your
phone
Bluetooth while
the car is
moving? Why?



Selective Attention

People focus
only on what
seems relevant

Divided Attention

Splitting
between tasks
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Ability to
maintain focus
over time

Why is it hard to sustain attention over a longer period of time?

Why is it hard to sustain attention over a longer period of time?

Fatigue, monotony, or distractions.

How is

ATTENTION

Relevant for designers?

- Interfaces should guide attention to what matters (through hierarchy, contrast, motion, placement).
- Reduce noise and distractions that steal attention (cluttered dashboards, irrelevant notifications).
- Respect limits of multitasking (e.g., driving while using navigation UI).

CLASS EXERCISE

ATTENTION ECONOMY

- Find an app/website you use regularly. Everyone should pick a different one.
- Analyse it using what we discussed about attention today.
- What is the app drawing your attention to?
- What is prominent? What is hidden away?
- What do you think were the tradeoffs to arrive at this design?
- If you had to change one thing to draw more or less attention, what would it be?

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Ergonomics

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Ergonomics - Physical & Cognitive

Search notes..

LECTURES

Lecture 2

14 January 2025

[Link to Slides](#) Physical Ergonomics Ergonomics vs. human factors vs. human–system interaction