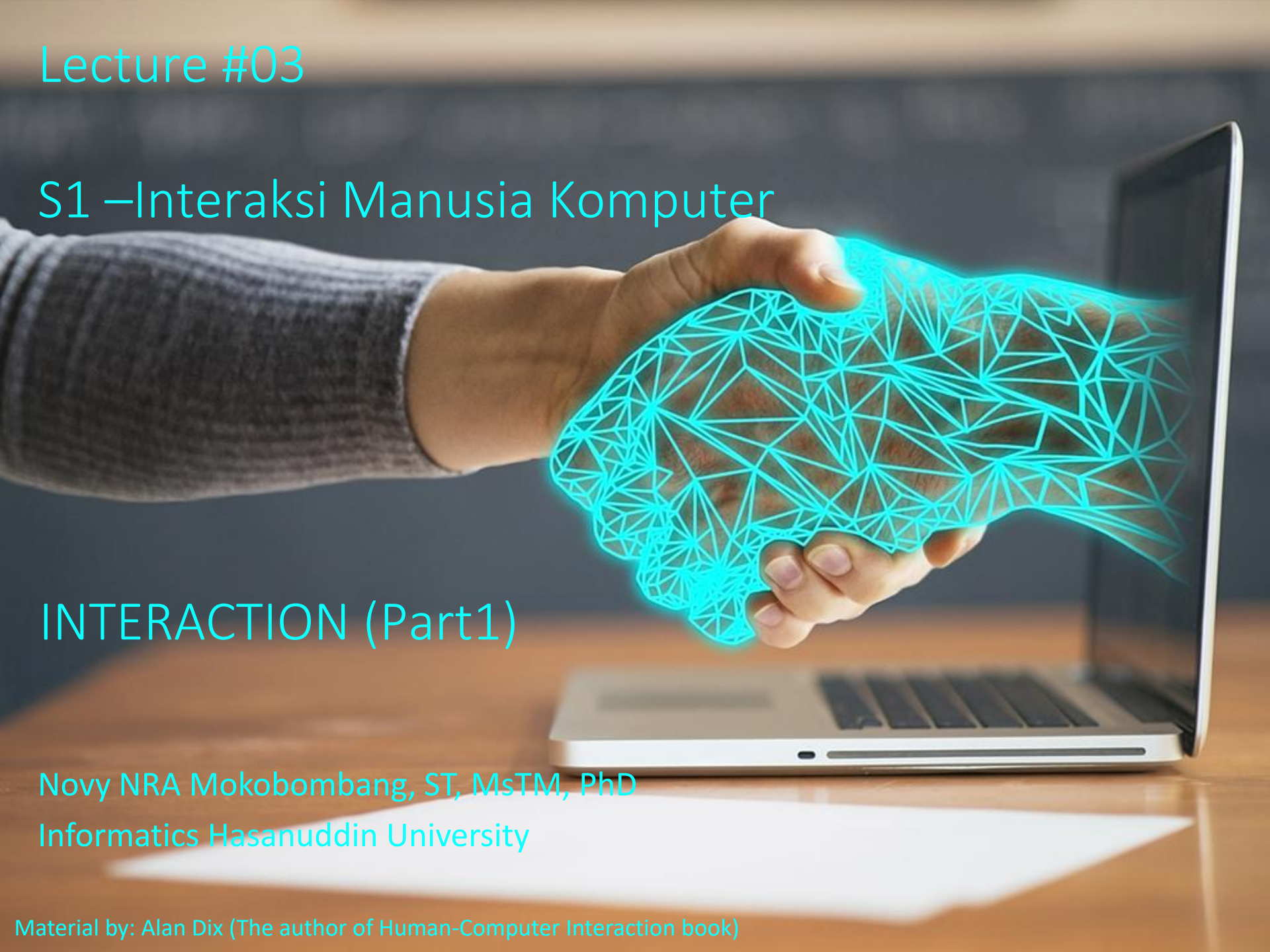
Lecture #03

S1 –Interaksi Manusia Komputer



INTERACTION (Part1)

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Material by: Alan Dix (The author of Human-Computer Interaction book)

What is interaction?

communication

user ⟷ **system**

but is that all ... ?

see “language and action” in chapter

The Interaction

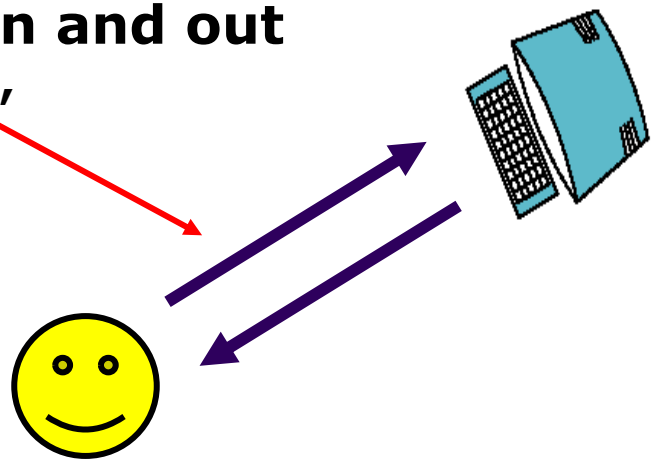
- interaction models
  —translations between user and system
- ergonomics
  —physical characteristics of interactiOn
- interaction styles
  —the nature of user/system dialog
- context
  social, organizational, motivational

Interacting with computers

to understand human–*computer* interaction

… need to understand computers!

what goes in and out
devices, paper, sensors, etc.



what can it do?
memory, processing, networks

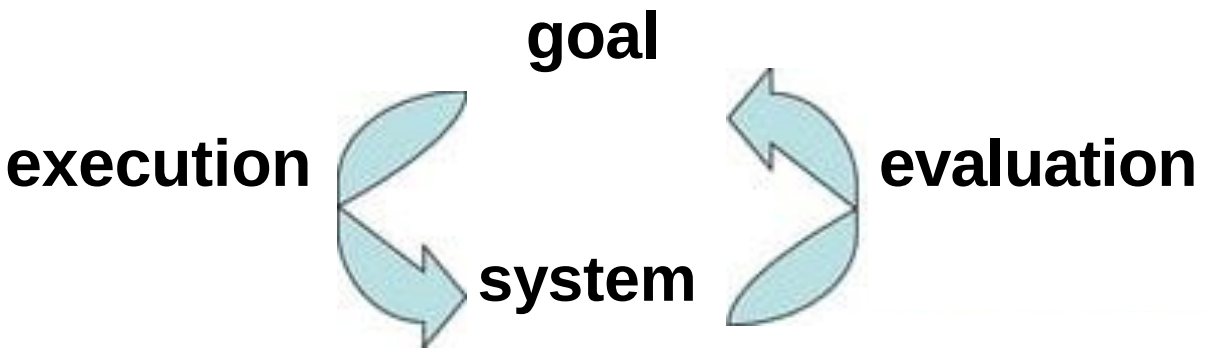
Donald Norman's model

- Seven stages
  - —user establishes the goal
  - —formulates intention
  - —specifies actions at interface
  - —executes action
  - —perceives system state
  - —interprets system state
  - —evaluates system sFate with respect to goal

- Norman's model concentrates on user's view of the interface

- https://www.youtube.com/watch?v=3_xPrBWIdz4

execution/evaluation loop



- user establish the goal
- formulates intention
- specifies actions at interface
- executes action

- perceives system state
- interprets system state
- evaluates system state with respect to goal

Using Norman's model

Some systems are harder to use than others

Gulf of Execution

user's formulation of actions

actions allowed by the system

Gulf of Evaluation

user s expectation of changed system state

actual presentation of this state

Human error - slips and mistakes

slip

- understand system and goal
- correct formulation of action
- Incorrect action

mistake

may not even have right goal!

Fixing things?

- slip - better interface design
- mistake — better understanding of system

Abowd and Beale framework

extension of Norman's model

Abowd & Beale interaction framework has 4 parts

- user
- system
- Output
- input

each has its own unique language

Interaction➔ translation between languages

problems in interaction = problems in translation

Using Abowd & Beale's model

user intentions
translated into actions at the interface
› translated into alterations of system state
reflected in the output display
interpreted by the user

general framework for understanding interaction

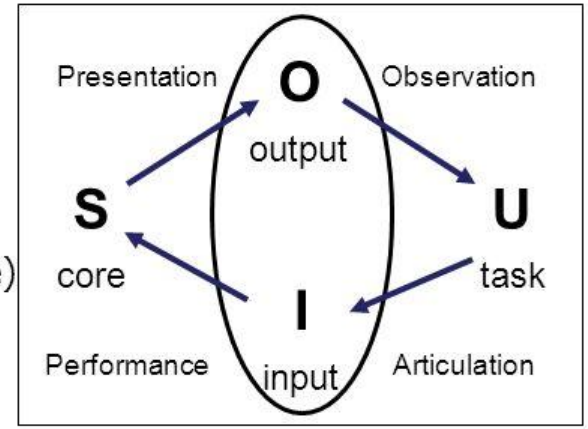
—not restricted to electronic computer systems

—identifies all major components involved in interaction

- allows comparative assessment of systems
- an abstraction

Interaction Framework

- Abowd and Beale expanded on the EEC to include the system
- **System (S)**—Uses its core language (computational attributes related to system state)
- **User (U)**—Uses its task language (psychological attributes related to user state)
- **Input (I)**—Uses its input language
- **Output (O)**—Uses its output language



- each has its own unique language interaction ⇒ translation between languages
- problems in interaction = problems in translation

Ergonomics

- Study of the physical characteristics of interaction
- Also known as human factors —but this can also be used to mean much of HCI!
- Ergonomics good at defining standards and guidelines for constraining the way we design certain aspects of systems

Ergonomics - examples

- arrangement of controls and displays
  - e.g. controls grouped according to function or frequency of use, or sequentially
- surrounding environment
  - e.g. seating arrangements adaptable to cope with all sizes of user
- health issues
  - e.g. physical position, environmental conditiDns (temperature, humidité), lighting, noise,
- use of colour
  - e.g. use of red for warning, green for okay, awareness of colour-blindness etc.

Ergonomics example

https://www.youtube.com/watch?v=EeIv7Iaw_6c

Industrial interfaces

Office interface vs. industrial interface?

Context matters!

type of data	office textual	industrial numeric
rate of change	slow	fast
environment	clean	dirty

. the oil soaked mouse!

Menus

- Set of options displayed on the screen
- Options visible
  - —less recall - easier to use
  - —rely on recognition so names should be meaningful
- Selection by:
  - —numbers, letters, arrow keys, mouse
  - —combination (e.g. mouse plus acce1eratDrs)
- Often options hierarchically grouped
  - —sensible grouping is needed
- Restricted form of full WIMP system

Natural language

Familiar to user

- speech recognition or typed natural language

Problems

—vague

—hard to do well!

Solutions

— To understand a subset

—pick on keywords