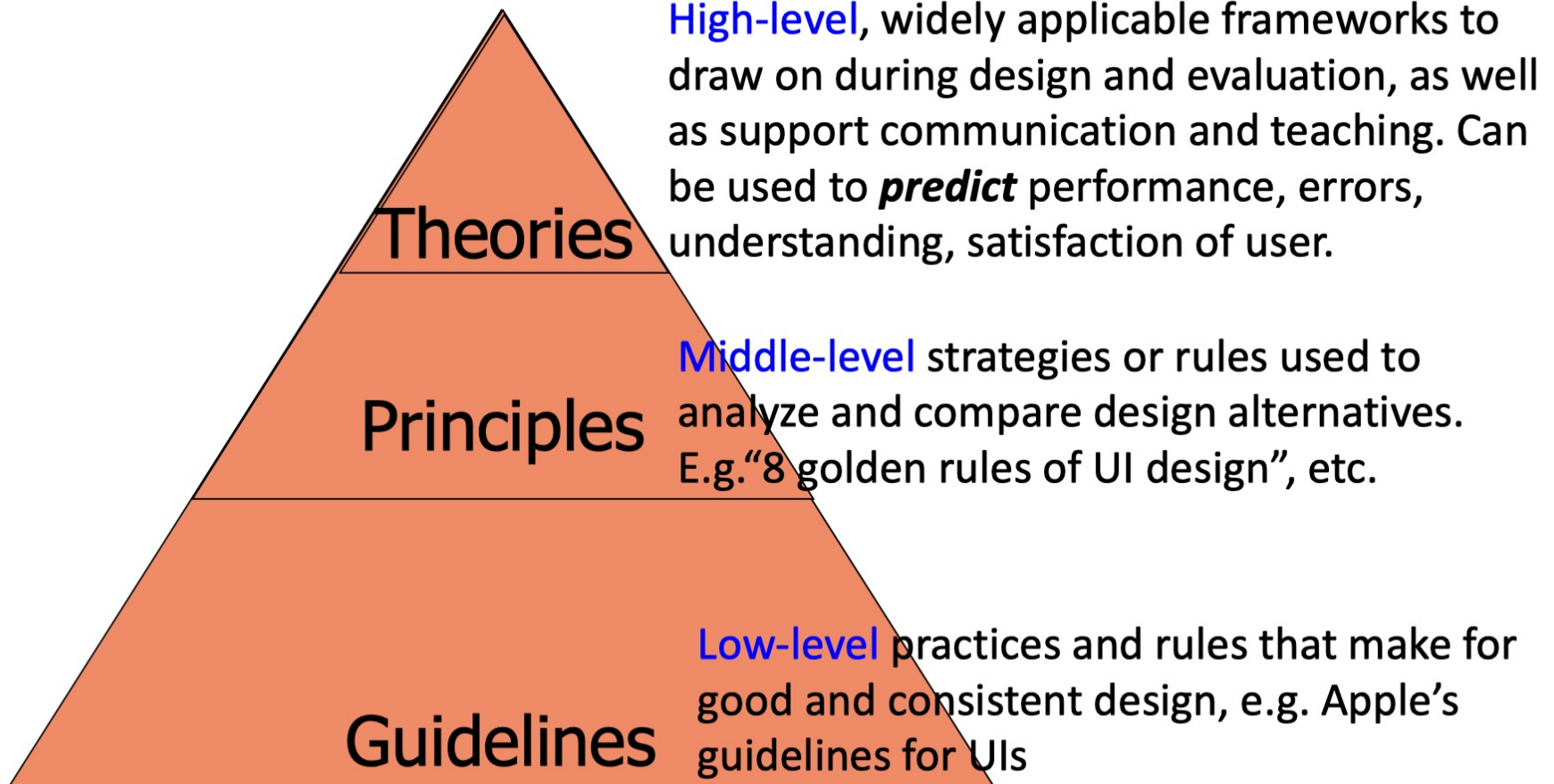


Lingwei Meng

# Review of Basic Concepts in Human Computer Interface

# Theory, principle and guideline



# Guidelines

- Guidelines were developed in the “early stage”
- Best Practices
  - For example, Windows and Apple UI guidelines
- From experience (empirical evidence)
- Good starting point for all projects that involve a UI
- Developed a “shared language”
  - Widget names, functionality name, etc.
- Gives developers a (shared) language to discuss the UI efficiently

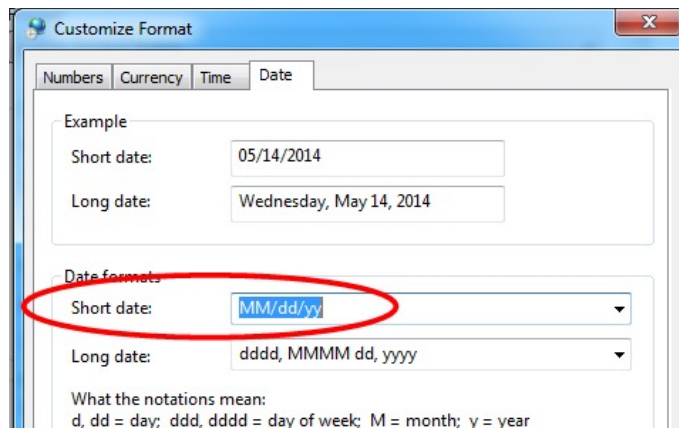
# The guidelines in different aspects

---


- Navigating the Interface
- Guidelines for Disabled
- Organizing the Display
- Get the user's attention
- Facilitate Data Entry

# 1.Guidelines of Display Organization

- Consistency of data display
  - Terminology, abbreviation, formats, colors, grammar, capitalization should be consistent!
    - E.g., DD/MM/YY vs MM/DD/YY vs YY/MM/DD ...
    - (20)20/02/20



# Consistency of data display

- Efficient information that can be assimilated by the user
  - Format for presentation *should be familiar* to the operator/user
  - No park! But... 
  - Similar but different UI
- Related to tasks at hand
  - E.g., justification, spacing, formatting, labels, units/measurements, numbers of decimal points, etc.

禁止车辆停放  
VS禁止车辆长时间停放  
“一道疤”比“两道疤”的优势在于，临时停靠不用“挨刀”。



禁止车辆停放



禁止车辆长时间停放

注意儿童VS步行  
只需要记住一点：黄色三角表示“注意”，起警示作用。



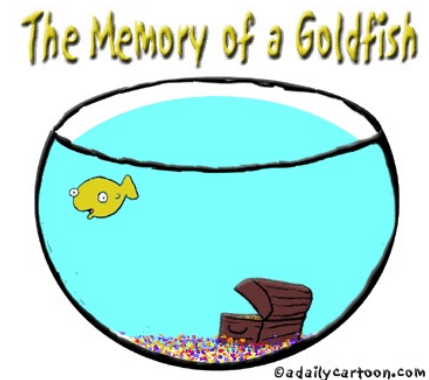
注意儿童



步行

# Consistency of data display

- Minimal memory load on the user
  - Minimize carry information over from one screen to another
  - Short-term memory.
    - capacity of  $7 \pm 2$ ; decay of 30 sec. to 2 min



- Labels and common formats should be provided for novice
  - **E.g. Give a guidebook for beginners**
- Require fewer actions (for both expert and novice users)
  - Tab key to move to next entry field vs. needing the mouse

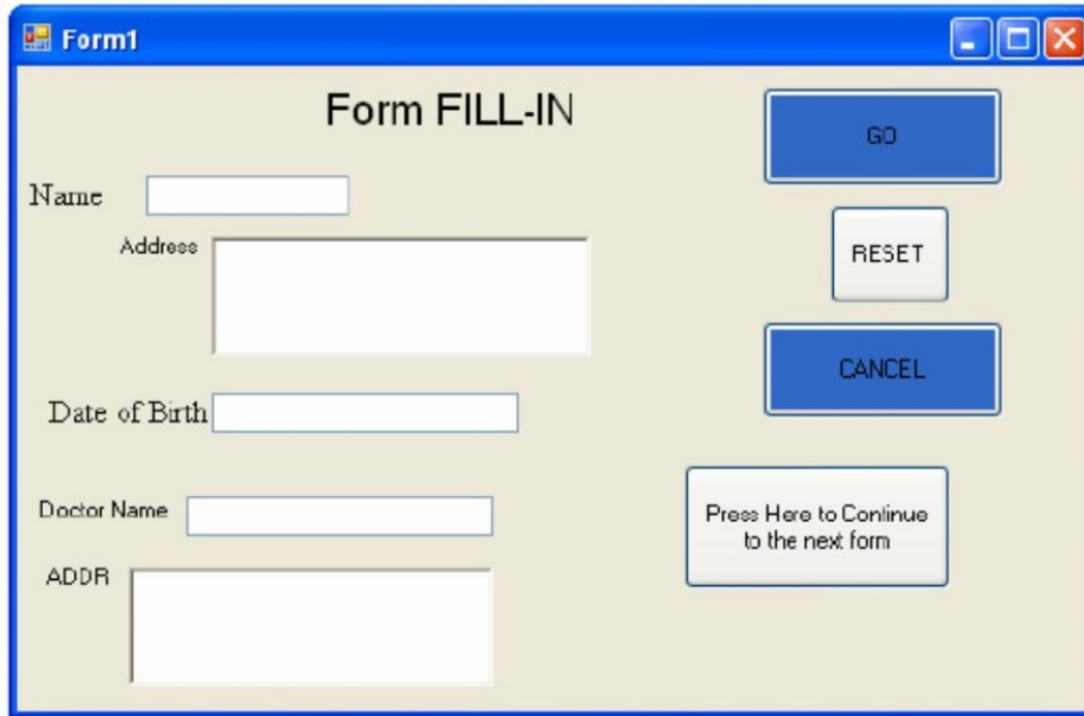
# Guidelines of Display Organization (cont.)

- Compatibility of data display with data entry
  - Entering data should look like the eventual viewing of the data
  - If possible, displayed fields should be editable (as input)
- Flexibility for user control of data display
  - For task convenience, user *can control how information is displayed* (e.g., sorting, ordering of columns and rows)
  - [diff. tasks may require viewing the same data in diff. ways]

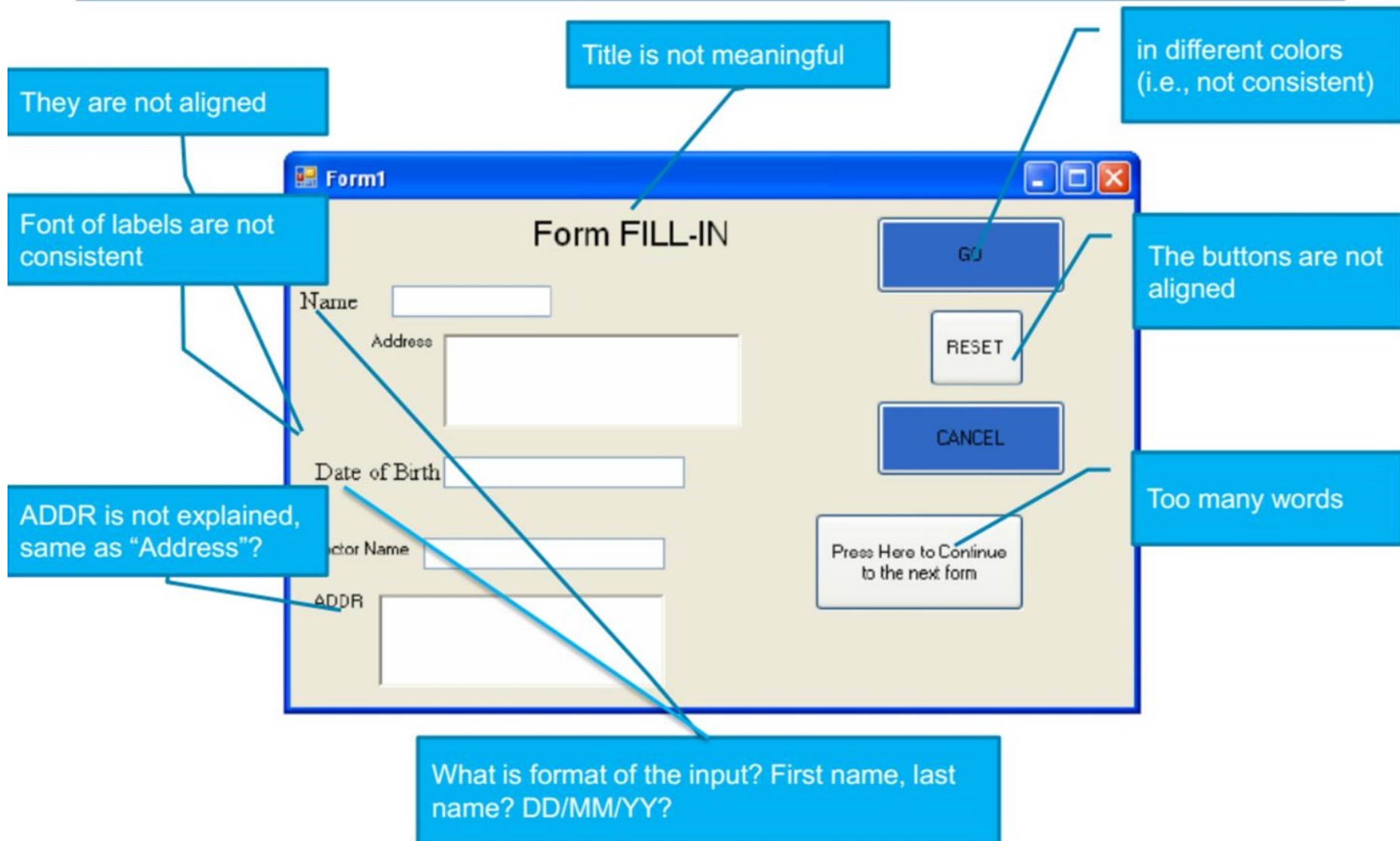


# specific problems with the interface

- Tools to design an interface, like MFC using C++ or Java



The image shows a graphical user interface window titled "Form1". Inside the window, the text "Form FILL-IN" is centered at the top. Below this, there are five text input fields arranged vertically on the left side, each with a label to its left: "Name", "Address", "Date of Birth", "Doctor Name", and "ADDR". On the right side of the window, there are three buttons stacked vertically: "GO", "RESET", and "CANCEL". Below these buttons is a button with the text "Press Here to Continue to the next form". The window has a standard Windows-style title bar with minimize, maximize, and close buttons.



## Two Google interfaces (A) and (B) for searching

---

### Interface A



Google Search

I'm Feeling Lucky

Google.com.hk offered in: [中文（繁體）](#) [中文\(简体\)](#)

## Two Google interfaces (A) and (B) for searching

### Advanced Search

### Interface B

Find pages with...

all these words:

To do this in the search box.

Type the important words: tri-colour rat terrier

this exact word or phrase:

Put exact words in quotes: "rat terrier"

any of these words:

Type OR between all the words you want: miniature OR standard

none of these words:

Put a minus sign just before words that you don't want:  
-rodent, -"Jack Russell"

numbers ranging from:

to

Put two full stops between the numbers and add a unit of measurement:  
10..35 kg, £300..£500, 2010..2011

Then narrow your results  
by...

language:

Find pages in the language that you select.

region:

Find pages published in a particular region.

last update:

Find pages updated within the time that you specify.

site or domain:

Search one site (like wikipedia.org) or limit your results to a domain like .edu, .org or .gov

terms appearing:

Search for terms in the whole page, page title or web address, or links to the page you're looking for.

SafeSearch:

Tell [SafeSearch](#) whether to filter sexually explicit content.

file type:

Find pages in the format that you prefer.

usage rights:

Find pages that you are free to use yourself.

Advanced Search

# Question 1

- For interface (A) and (B), which user skill level is the respective interface targeting?
- **Solution:**
  - The interface (A) is aimed for novice (or intermittent) users, while the interface (B) is for expert users.

## Question 2

- By providing both interfaces (A) and (B), **which one within the 8 golden rules** is Google supporting?
  - Strive for consistency
  - Cater to universal usability
  - Offer informative feedback
  - Design dialogs to yield closure
  - Prevent errors
  - Permit easy reversal of actions
  - Keep users in control
  - Reduce short-term memory load

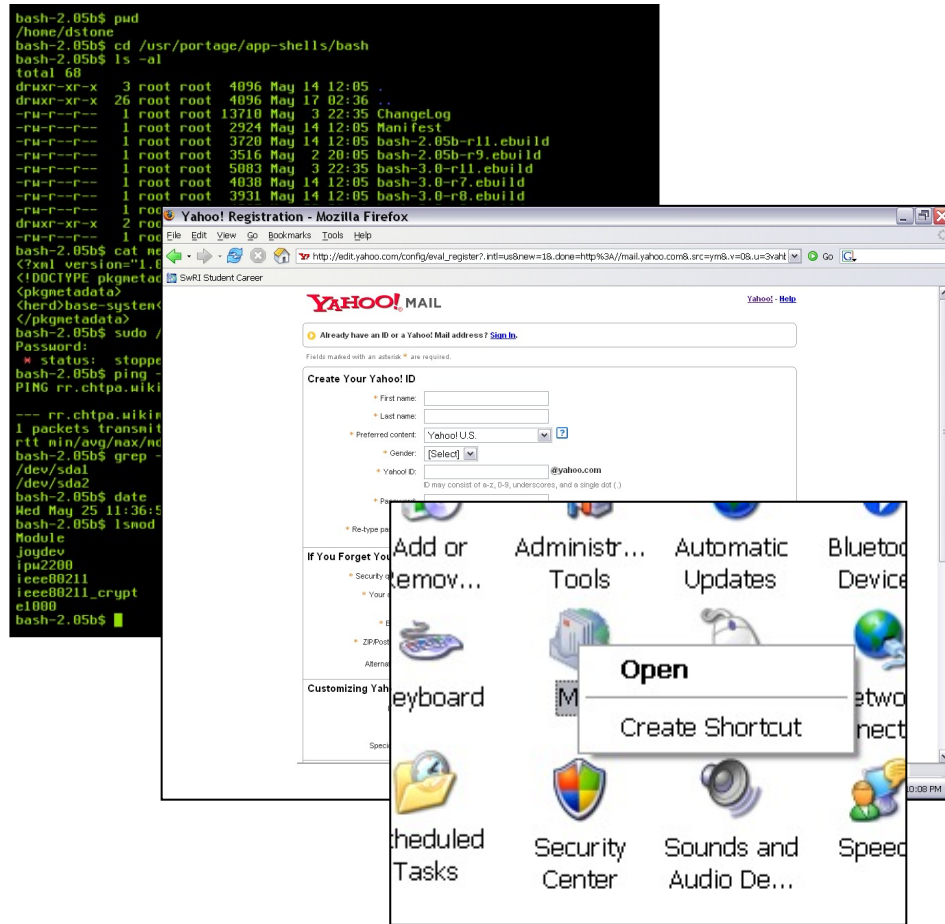
# Question 2

- By providing both interfaces (A) and (B), **which one within the 8 golden rules** is Google supporting?
- Strive for consistency
- **Cater to universal usability**
- Offer informative feedback
- Design dialogs to yield closure
- Prevent errors
- Permit easy reversal of actions
- Keep users in control
- Reduce short-term memory load



## 2. Five main types of interaction style

- Command – Line.
- Form-Fill.
- Menu Selection.
- Direct Manipulation.
- Anthropomorphic
  - Nature language





# Pros and Cons of interaction style 'Command Language'

- Features:
  - Means of directly instructing the system using function keys, commands or abbreviations.
    - Action objects interface (AOI), e.g., `cp test.txt test_copy.txt`
  - Provide access to the system functionality.
  - Commands often have a number of options that vary its behavior and can be applied to many objects at once.
  - **Suitable for expert users**, since it provides a sense of being in control.
- Limitations:
  - Commands and command sequences need to be **remembered**.
  - Low tolerance of errors typing
  - Error messages and online assistance are hard to provide due to diverse possibilities.

# 3. Stages-of-action theory

- Seven stages of action theory by Donald Norman:
  - Forming the goal (e.g. cook a nice meal)
  - Forming the intention (e.g. cook chicken with hoisin sauce)
  - Specifying the action (e.g. prepare chicken, prepare sauce...)
  - Executing the action
  - Perceiving the system state (e.g. smell, look, taste of dish)
  - Interpreting the system state (e.g. evaluate chicken dish)
  - Evaluating the outcome (e.g. evaluate chicken dish as a nice meal)



<https://www.youtube.com/watch?v=n4fCHYbRcKw>

## TED: Tony Fadell

---

[https://www.ted.com/talks/tony\\_fadell\\_the\\_first\\_secret\\_of\\_design\\_is\\_noticing](https://www.ted.com/talks/tony_fadell_the_first_secret_of_design_is_noticing)  
<https://www.youtube.com/watch?v=9uOMectkCCs>

**TED** Ideas worth spreading

WATCH

DISCOVER

ATTEND

Tony Fadell:

# The first secret of design is ... noticing

TED2015 · 16:41 · Filmed Mar 2015

29 subtitle languages ?

View interactive transcript



## TED: Donald Norman

---

[https://www.ted.com/talks/don\\_norman\\_on\\_design\\_and\\_emotion?language=en](https://www.ted.com/talks/don_norman_on_design_and_emotion?language=en)  
<https://www.youtube.com/watch?v=RIQEoJaLQRA>

**TED** Ideas worth spreading

WATCH

DISCOVER

Don Norman:

# 3 ways good design makes you happy

TED2003 · 12:41 · Filmed Feb 2003

30 subtitle languages ?

View interactive transcript

