# Icons

## SWEN-444

A small image representing an object
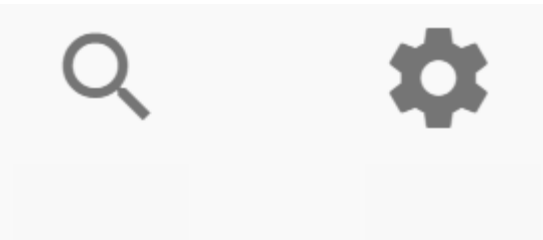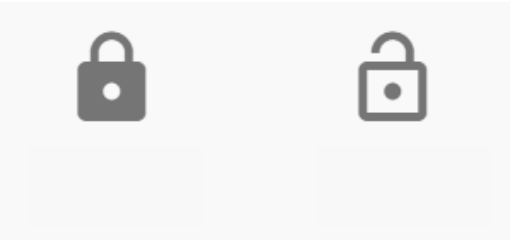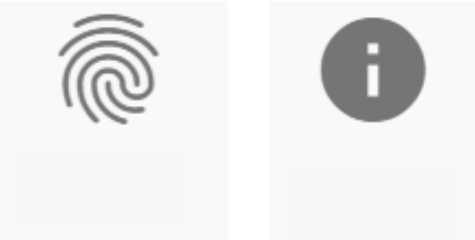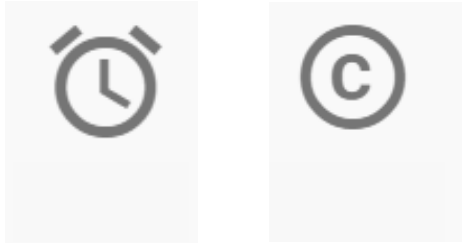
# Android Material Design
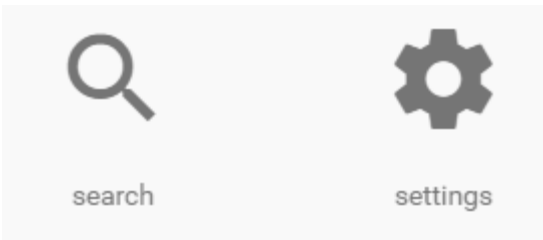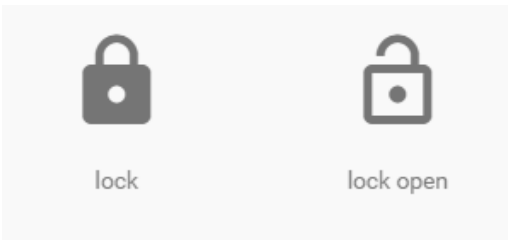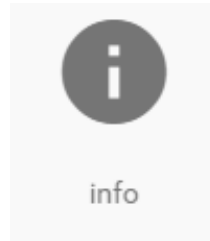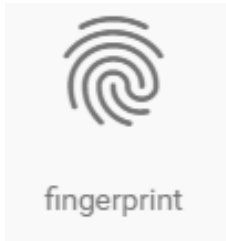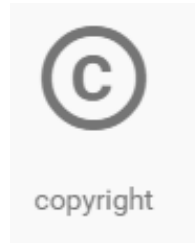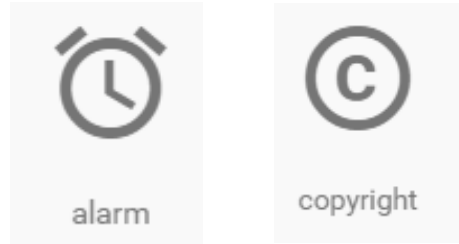
# Android Material Design

# Human Issues Concerning Icons

- **Recall** of **images** is **superior** to that of text
- **Images** are **more easily distinguished** than text
- People **perform better** with **icon** targets than with text targets
- However, icons are **not automatically self-explanatory**
- Good icon design represents **metaphors of real world objects**
- Potential **ambiguous** perception of icons
  - **Representations of objects** in the interface
  - **Objects themselves**
  - E.g., MS Office save icon

# Using Icons in Interaction Design: Distinguishable

- **Humans respond first** to the **icon's physical properties** and **then semantic associations**
- The **intensity** of an **icon's physical characteristics** can affect the way we **find** and **comprehend** icons
  - Color
  - Size
  - Shape
  - Location
  - (Research results – it depends on context)

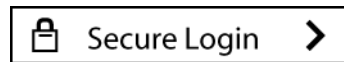# Using Icons in Interaction Design: Conventions

Amazon.com shopping cart

Audio icon—notes

Home icon

Secure Connection icon

Firebox browser

[http://glyphicons.com/](http://glyphicons.com/)

[Android Material Design Icons](Android Material Design Icons)

# Using Icons in Interaction Design: Context

- **Context supplies a frame of reference**
  - B I U vs **B** *I* <u>U</u> in Office applications
- Icons can be seen in many different contexts:
  - **Physical**
    - Screen location, contrast, juxtaposition to each other, screen density
  - **Cognitive** – user knowledge and experience, culture
  - **Metaphorical** – real world meaning
  - **Temporal** – viewing context changes via screen navigation; e.g., icons may be grayed out or disappear

# Using Icons in Interaction Design: Context
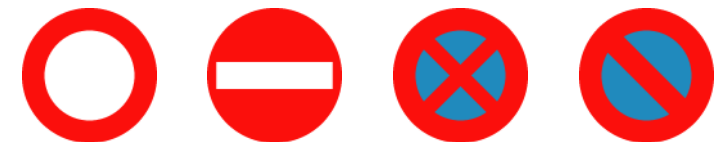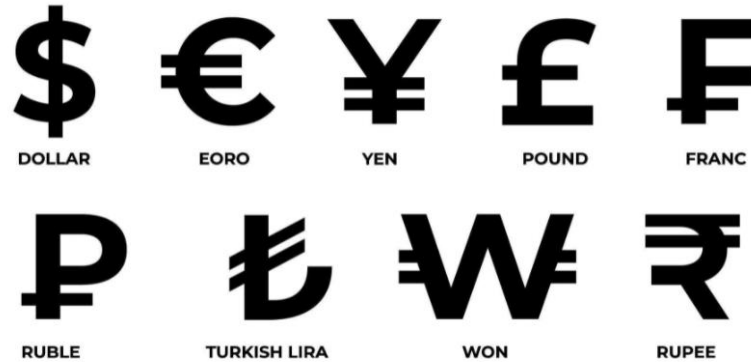


European Road Signs

# Principles for Icon Creation

- **Simplicity/complexity** – research is inconclusive on what is best; want **high** information **signal to noise ratio**
- **Cohesiveness** –**families** of related icons
  - **Conceptual** – perform related functions
  - **Visual** – share visual characteristics
- **Distinctiveness** of individual icons (within a group / family)
- **Familiarity** to user
  - Real world **metaphors**
  - Abstractions based on universally understood **conventions**
  - Domain **context** – application and locale

## Good affordances

# Icon Types

- **Pictogram**: a picture that resembles what it signifies
  - Email envelope
- **Abstract Shapes**     **?**
  - Arithmetic symbols, question mark
- **Ideogram**: a symbol that stands for an idea or concept
  - Floppy disk to save a file to a folder
- **Logogram** (Logograph): a symbol that represents a word
  - Letter "U" to represent "you" or heart graphic for "love"

# Physical Characteristics

- Icon **size and shape**
  - Typically **square**
  - **Size standards** exist for different platforms (see vendor guidelines)
- **Transparency and background**
  - **Icon on application background** (icon background is transparent)
    - May need dark **borders** to **contrast application backgrounds**
  - **Icon with background mask** to **contrast application background**

# Icon Grammar

- **Principles** that **govern** the **internal structure** and **meaning** of icon families
- This "grammar" is constructed on rules and procedures
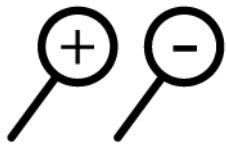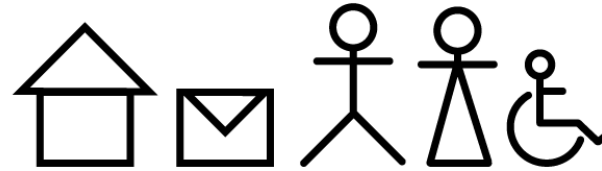
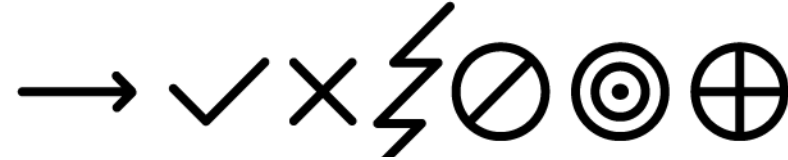Zoom icons.
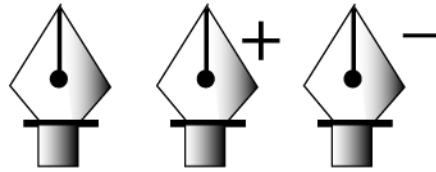
Pen icons.

Lasso selection icons.

- The grammatical rules must be **observable, logical, predictable, and consistent**; i.e., the user gets it

# Deconstructing Icons

- **Basic shapes**



- Indicators
- Styles
- Canonical view
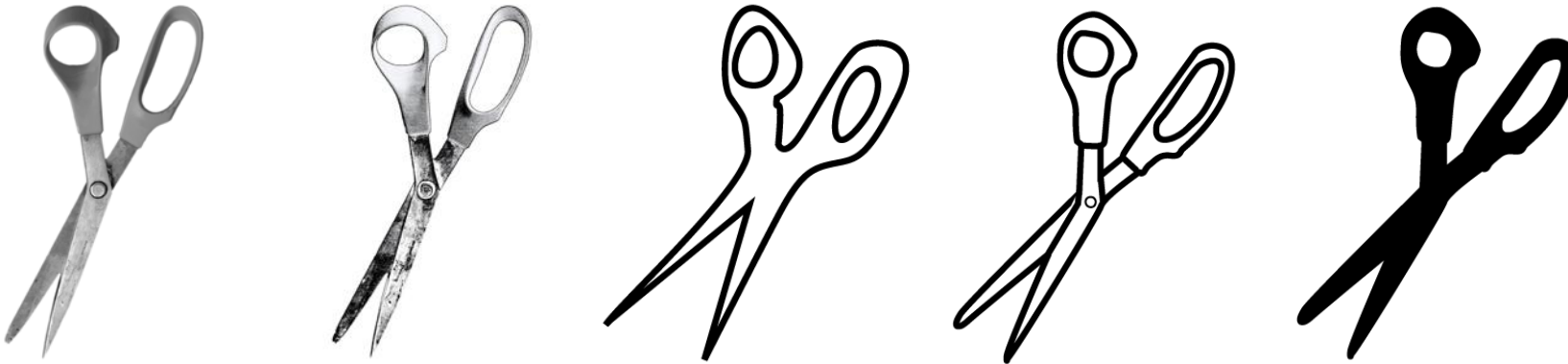- Aggregate symbols

# Deconstructing Icons

- Basic shapes
- **Indicators** show action, state, direction

- Styles
- Canonical view
- Aggregate symbols

# Deconstructing Icons

- Basic shapes
- Indicators
- **Styles**
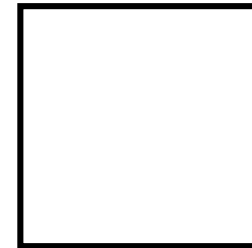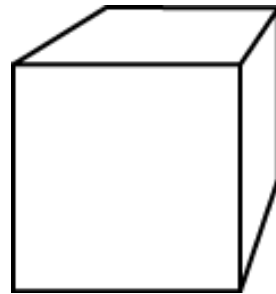


Photo, drawing, caricature, outline, silhouette

- Canonical view
- Aggregate symbols

# Deconstructing Icons

- Basic shapes
- Indicators
- Styles
- **Canonical view** is most **common**, easily recognized, typlifies the object

Box is 3D

- Aggregate symbols

# Deconstructing Icons

- Basic shapes
- Indicators
- Styles
- Canonical view
- **Aggregate symbols**: symbol combos for complexity
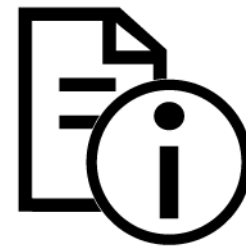
# Icon Design Case Study

- Study to create a new icon design for "Do Not Sell My Personal Information" opt-out choice
- The second iteration after cloud sourced review – best cognitive affordance?



"Informing California Privacy Regulations with Evidence from Research", ACM, 03/2021

# Cognitive Affordance Case Study

- Next iteration added label text variations to the previous icons for more crowd source review

- Best combination?

| | |
|---|---|
| **Do Not Sell My Personal Information** | **Privacy Choices** |
| **Do Not Sell My Info** | **Privacy Options** |
| Don't Sell My Info | Privacy Opt-Outs |
| Do Not Sell | **Personal Info Choices** |
| Don't Sell | Personal Info Options |
| Do-Not-Sell Choices | Personal Info Opt-Outs |
| Do-Not-Sell Options | Do Not Sell My Info Choices |
| Do-Not-Sell Opt-Outs | Do Not Sell My Info Options |

"Informing California Privacy Regulations with Evidence from Research", ACM, 03/2021

# Cognitive Affordance Case Study

- Labels reduced misconceptions of icon meaning
- Recommended best combination:

stylized-toggle

**Privacy Options**

"Informing California Privacy Regulations with Evidence from Research", ACM, 03/2021