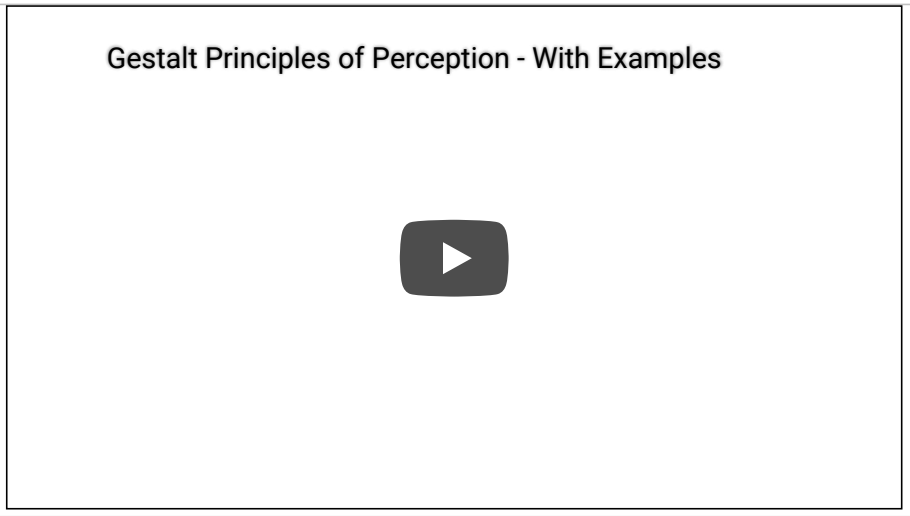
Comp 341/441 - HCI

Spring Semester 2020 - Week 10

Dr Nick Hayward

Video - Gestalt Laws of Perception



Visual Attributes

contrast

- elements used as components to build a graphical interface
  - *might include buttons, icons, drop-down lists, menus, checkboxes…*
- attributes are properties of these visual elements
  - *attributes as styling for a page's visual elements*
- patterns in design and layout aid a user
  - *reduces cognitive load, creates an aid to vision, perception, recognition…*
- elements with similar function should be style in a similar manner
- **contrast** presents itself as an intentional and easily recognisable difference
  - *eye-catching, attention grabber for a user…*
  - *can provide users with clues to elements, content…*

Visual Attributes

size

- **size** is another way we can create differentiation in our designs
  - *generally easy for a user to discern and understand*
- size has been used for centuries in print design
  - *Lombardic capitals in mediaeval manuscripts and books*
- size is often perceived as visual dominance
  - *a sense of greater importance*
  - *size can make a difference within certain aspects of interface design*
- size has been applied in the use and development of grid layouts in web design
  - *allow us to easily define relative sizes for content, blocks…*
  - *larger centre panels often perceived as more important than headers, sidebars…*
- data visualisation uses this principle for differentiation
  - *quickly and effectively communicate larger data values*
  - *relative weights of data*
- assigning size attributes needs to consider relative weighting of importance
  - *relative value of elements to task at hand…*

Visual Attributes

colour

- **colour** can play a vital role in the presentation of an interface
  - *also plays important role in user perception*
- after size, colour is perceived as next important attribute
  - *aids user differentiation*
- colour can help guide a user to certain aspects of an interface
- elements that share identical colours often perceived as in the same group
  - *contrasting colours present a useful juxtaposition of elements*
- cultural pre-conceptions aside
  - *certain colours have perceived inherent meaning*
  - *red for danger, errors…*

Visual Attributes

shape, direction, and angularity…

- users are often able to quickly and easily differentiate shapes and patterns
  - *Gestalt principles in practice*
  - *easily differentiating squares from circles and triangles*
- easily differentiate content and elements
  - *apply shapes as outlines, borders, content differentiation…*
- elements placed at an angle to one another perceived as jarring and mis-matched
- grid design and layouts further heighten this issue of angles
- angles perceived as creating a sense of **visual tension**
  - *often distracting for a user*
- angles can, however, be used to highlight and contrast elements

Visual Attributes

weight, text styling, texture…

- weight in interface design
  - *refers to the thickness of a line, font…*
  - *its relative presentation within a design*
- can be a quick and easy differentiating factor within our designs
- a variation on the concept of **contrast**
- text styling can be a very useful and practical difference in designs
- texture can also play a useful role in our designs
- texture has a broad use in graphic design
  - *often perceived relative to the overall visual look and feel of a block of text*
  - *its overall visual effect*

Usability

Intro

- may consider an application, product, software as usable if it fulfills
  - *can be efficiently operated*
  - *provides an overall pleasant usage experience*
  - *can be easily learned*
- often difficult to judge the usability of a product etc
  - *rules are often subjective in nature relative to usability*
- each rule may vary greatly from user to user due to
  - *different skill sets*
  - *existing knowledge*
  - *previous experience*
- user's expectations, opinions, general preferences affect perception of usability
- some users are naturally more curious, patient, and persistent
- user experience may also be influenced by
  - *attitudes and experiences of friends, contemporaries…*
  - *general moods*
  - *stress levels, fatigue, distractions*

Image - Usability

Scissors

Scissors

Source - RightLeftRightWrong

Video - Usability

Left-handed in a right-handed world

What it’s like to be left-handed in a right-handed world...
Source - YouTube

Usability

end of learning

- clear functionality and general operations with appropriate visible controls, labels…
- clear navigation options and paths, plus user's current location
- minimum memorisation and recall for sequences, commands, actions
  - *easy to remember and recall*
- product, application encourages exploration and experimentation
- mistakes are easily recoverable, and operations can be retried if necessary
- assistance and help is easily accessed, clear, correct, and relevant
- consistent interaction behaviour, visual layout, terminology
  - *helps encourage correct user mental model*
- limited surprises for application behaviour and usage
  - *less for the user to learn…*
- where possible, a user is guided through steps to complete complex tasks…
- clear feedback is provided when a user performs an action
- current status of the system is clearly presented and labelled
- application, system, or product should form a coherent whole

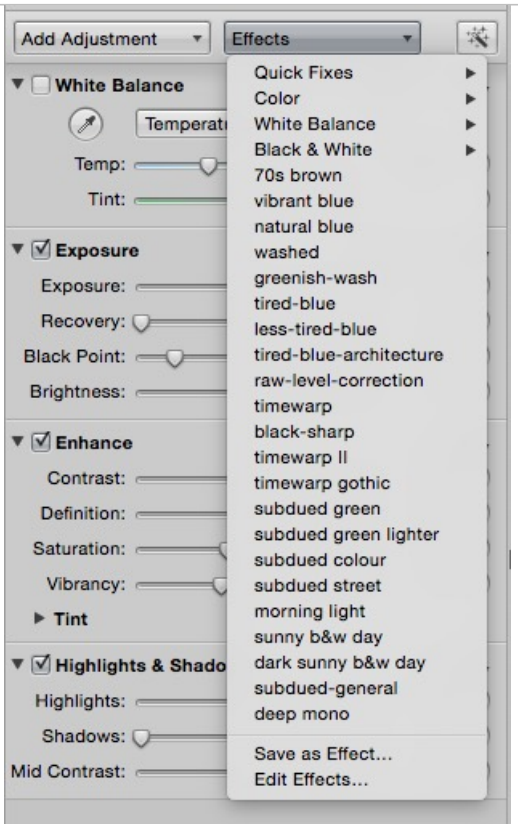
Usability

efficiency

- straightforward, easy for an experienced user to repeat actions or complete tasks
- minimal deliberate or strenuous thinking to perform routine application tasks
- enable and encourage a user to achieve a state of **flow**
- allow a skilled user to achieve a low error rate
  - *clear notification and detection of limited errors and mistakes*
- stable performance and reliability to prevent delays and hindrances
- minimal, if any, surprises and inconsistencies in interaction and design patterns

Image - Usability

preset effects



Aperture Effects

Source - Aperture

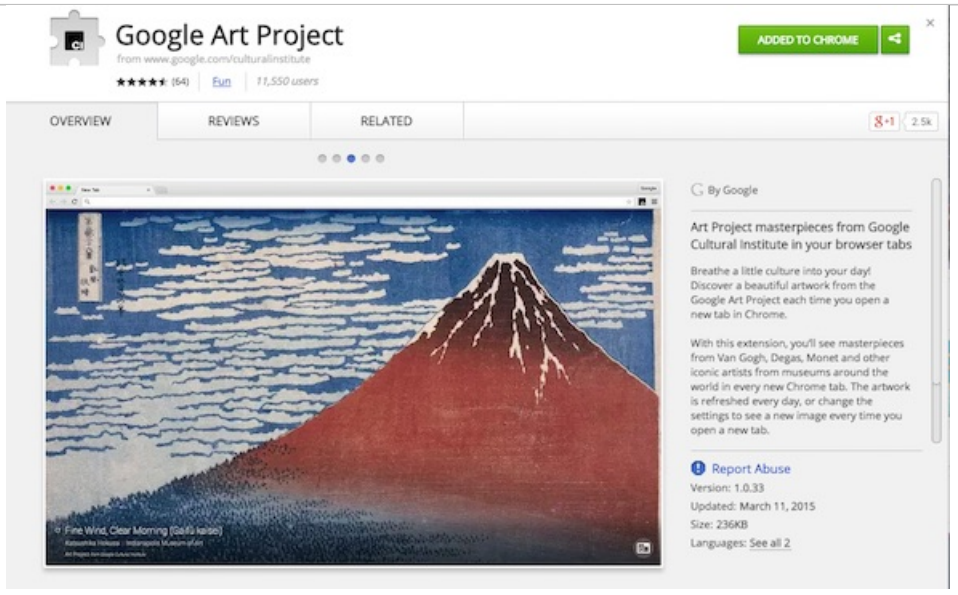
Usability

experience

- possible to consider a product or application relative to its experience
  - *whether it is a pleasant experience or not…*
- is the application's design and interface pleasant and appealing for its users
- does it promote and encourage positive productivity
- eg: if we consider games, does the application's experience
  - *provide enjoyment for its users*
  - *challenge them relative to their abilities*
  - *provide general entertainment and distraction*
- does the user feel rewarded and positive for tasks and actions completed
- again, is the product stable, reliable, and trusted by users
- likewise, are the delays sufficiently limited to avoid frustrations for users
- is the product free of unnecessary annoyances and frustrations
  - *help promote user satisfaction, reduce cognitive overload, and help achieve and maintain a sense of flow for users*

Image - Usability

pleasing concepts



Chrome Art

Source - Google Art Project

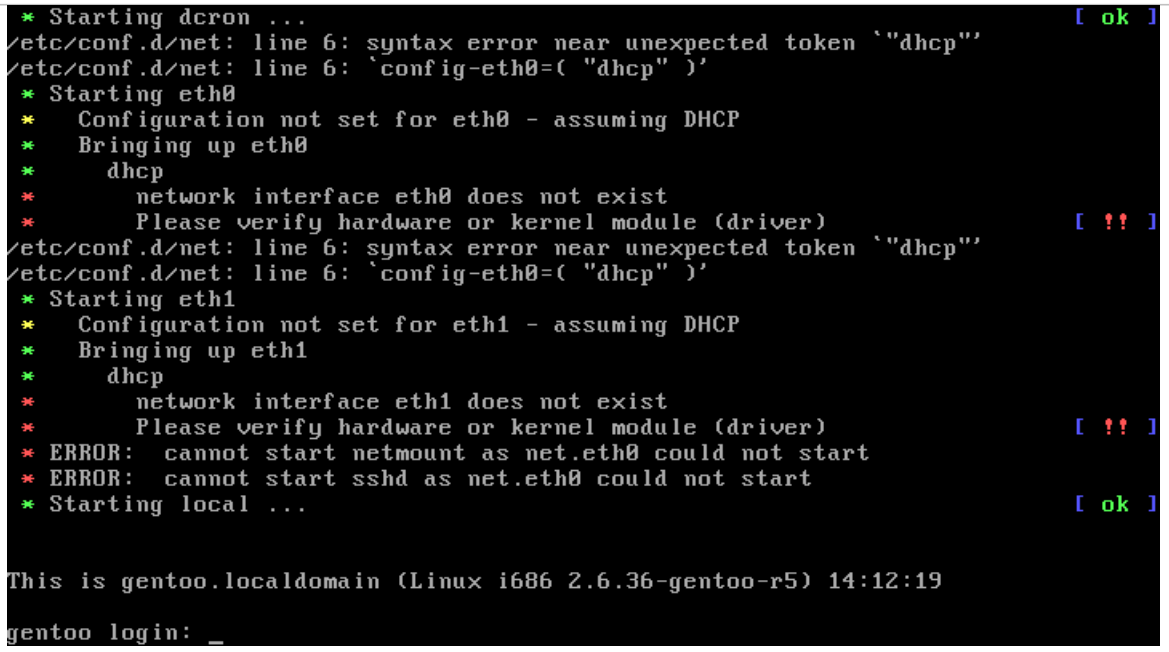
User Experience (UX)

overview - part 1

- broad and over-arching concept
- need to consider many disparate concepts
  - *user's reaction, both positive and negative*
  - *user's general experience with the application including*
    - design and interface
    - potential results and outcomes
  - *general functionality and what an application can do for a user*
  - *does the application, product etc solve a defined problem?*
  - *what can an application help a user to achieve?*
  - *what entertainment value does the application etc provide?*
- software application UX also influenced by acquisition
  - *was it easy to find, download, install, update?*

Image - User Experience (UX)

Linux installs



Gentoo Linux

Source - Gentoo Linux

User Experience (UX)

overview - part 2

- user's identification of an **acceptable** product
  - *sense of usability and product preferences*
- Shackel, B. 1991.
  - *product's utility, usability, attraction relative to involved costs…*
- product considered not acceptable vast majority of users seek market alternatives
- UX inherently important aspect of goal to develop and provision successful application…

Image - User Experience (UX)

Windows

Windows

Source - Windows Comparison

Designing our app

considerations - part 1

- tasks and activities a user can and should be able to perform with the product
  - *ie: what is the considered scope of the product's functionality?*
- as we consider each task, how will the interaction develop and be processed?
  - *in effect, what are the expected steps and actions for the user and the product?*
- we need to consider carefully the overall visual style or appearance of the application
  - *eg: visual design and layout for the basic page templates or screen layout - fonts, colours, typography and iconography, any branding...*
- what are the defined **places** in our application?
  - *eg: pages for a website, navigation controllers and panels for mobile apps, levels in games, and so on...*
- how does our user actually navigate between these **places** within our application?
- as we consider further our app's places, what content and layout will be presented to the user in each *place*.
  - *which controls are available, how will they be presented, arranged, and so on?*

Designing our app

Fun exercise - part 1

Consider the design of an application to help a person **learn to play a game/s...**

Then, outline the following

- what is the considered scope of the product's functionality?
- what are the expected steps and actions for the user and the product?
- what are the defined **places** in our application?

Designing our app

considerations - part 2

- how will the user interact with these controls?
  - *ie: just mouse and keyboard, is touch accepted?*
  - *are there behaviours associated with these controls?*
- are there any events within our application that are not triggered by the user?
  - *eg: timer driven events, remote calls and services, backup protocols, automatic updates…*
  - *are any behaviours actioned during such events?*
- does the application store, request, manage any data?
  - *what type of data, where, format, protocols, services…*
  - *how do we present this data on-screen and to the user?*
- is there a naming scheme for interface and interaction elements?
  - *eg: data, elements, places, objects, controls, navigation, and any other pertinent concepts…*

Designing our app

Fun exercise - part 2

Continue the design of an application to help a person **learn to play a game/s...**

Outline the following

- which controls are available, how will they be presented, arranged, and so on?
- are there any events within our application that are not triggered by the user?
  - *consider effective management of these events...*
- does the application store, request, manage any data?

Designing our app

considerations - part 3

- error handling scheme for the app
  - *how will the user be informed? will the user have the option to gracefully recover from errors etc?*
- are there defined user roles in the app?
  - *what actions, privileges are permitted per role?*
- how do our users request or find assistance within the app?
  - *is it an active system or passive? ie: interactive or reference based documentation, tutorials, videos, discussion forums etc...*
- how is the app structured to promote app guidance for users through tasks?
  - *help for the users to work out how the app actually works...*

Designing our app

Fun exercise - part 3

Continue the design of an application to help a person **learn to play a game/s...**

Outline the following

- are there defined user roles in the app?
- how do our users request or find assistance within the app?
- how is the app structured to promote app guidance for users through tasks?

Designing our app

considerations - part 4

- need to engage in a number of related tasks
  - *eg: gathering requirements and their analysis*
- need to understand our user base, the target audience for our app
  - *includes their characteristics, requirements, how they intend to interact with the app*
- as designers and developers we will need to understand
  - *the type of work users want to complete*
  - *the inherent tasks*
  - *the effective problem domain*
- to a lesser degree, this will also require an understanding of the technology requirements
  - *eg: chosen languages, frameworks, device hardware...*
  - *impacts how and what we are able to design and provision for our users*
- need to consider prototypes, mockups, design documentation and specifications, and testing...

Resources

- Being left handed in a right-handed world - YouTube
- Card, S.K., Moran, T.P. and Newell, A. *The psychology of human-computer interaction.* Lawrence Erlbaum Associates. 1983.
- Google Art Project
- Usability - RightLeftRightWrong