

Fluid Navigation

YING SHEN

SCHOOL OF SOFTWARE ENGINEERING

TONGJI UNIVERSITY

A solid orange horizontal bar at the bottom of the slide.

Outline

Introduction

Navigation by selection

Small displays

Content organization

Audio menus

Form fill-in and dialog boxes

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Introduction

Navigation enables users to know where they are and to steer themselves to their intended destination

Navigation is about getting work done through a series of actions

- Key to successfully operating interactive applications

The goal for designers is to enable fluid navigation that allows users to get to where they want to go



Introduction

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信息中心

- 同济大学软件学院第六届国际青年学者论坛通知 2021-03-27
- 软件学院关于 2020-2021 学年第二学期本科生校级助学金、大学生成才助学金考核通知 2021-03-20
- 关于组织开展“永远跟党走”迎接中国共产党建党100周年主题征文比赛通知 2021-03-19
- **关于开展2021年度同济大学市级及校级 优秀毕业生评选工作的通知 (...)** 2021-03-16
- 2017级本科生毕业实习流程 2020-10-12
- 免试攻读硕士研究生须知 (本科生) 2021-01-05

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关于开展2021年度同济大学市级及校级 优秀毕业生评选工作的通知 (本科生)

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为全面落实全国教育大会和全国高校思想政治工作会议精神,按照《普通高等学校学生管理规定》(教育部第41号令)等文件对德智体美劳全面发展、表现突出的学生给予表彰和奖励的要求,充分发挥优秀大学生的示范激励引领作用,引导大学生树立正确的成长观和择业观,根据《同济大学本科优秀毕业生评定细则(2018年修订)》(同济学[2018]57号)要求和学校优秀毕业生评选相关工作安排,现启动2021年度优秀毕业生评选工作。现将软件学院本科生优秀毕业生评选有关事项通知如下:

一、评选对象:

同济大学软件学院2021年应届本科毕业生。

二、评选条件:

- 1.具有坚定正确的政治方向,德智体美劳全面发展。
- 2.遵纪守法、品德优秀,诚信意识较强和学术道德良好,在校期间未受过处分,无不良信用记录。
- 3.按时修完教学计划中的全部学业,学习勤奋、成绩优异,积极参加社会实践和志愿服务,具有较强的实践和创新能力。
- 4.具有正确的就业观和择业观,对响应国家号召献身国防事业,自愿赴西部、边远、贫困地区和艰苦行业等基层和重点领域、新兴领域、国际组织就业的毕业生,优先推荐评选。
- 5.原则上应获得过校级以上荣誉,或在某一方面表现突出,成绩显著或作出突出贡献。
- 6.具体评选细则参照《同济大学本科优秀毕业生评定细则(2018年修订)》。

三、软件学院优秀毕业生名额分配

- 1.上海市优秀毕业生11名
- 2.同济大学优秀毕业生11名

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Introduction

Navigation techniques include menus, embedded links, or tool palettes



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- 同济大学软件学院第六届国际青年学者论坛通知
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- 【研究生】2021年度同济大学优秀毕业研究生评选工作的通知
- 关于开展2021年度同济大学市级及校级 优秀毕业生评选工作的通知（本科生）
- 关于做好2021年度适龄学生兵役登记的通知
- 关于做好2021年学生寒假放假及春季学期开学等工作安排的通知
- 关于开展“同心筑梦，济世中华”2021年寒假返乡路费资助项目的通知

Introduction

Users can touch, tap, or swipe of the figures to indicate their choices

Careful design, keyboard shortcuts, and gestures allow expert users to navigate quickly



Outline

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Navigation by selection

Choices can be presented explicitly

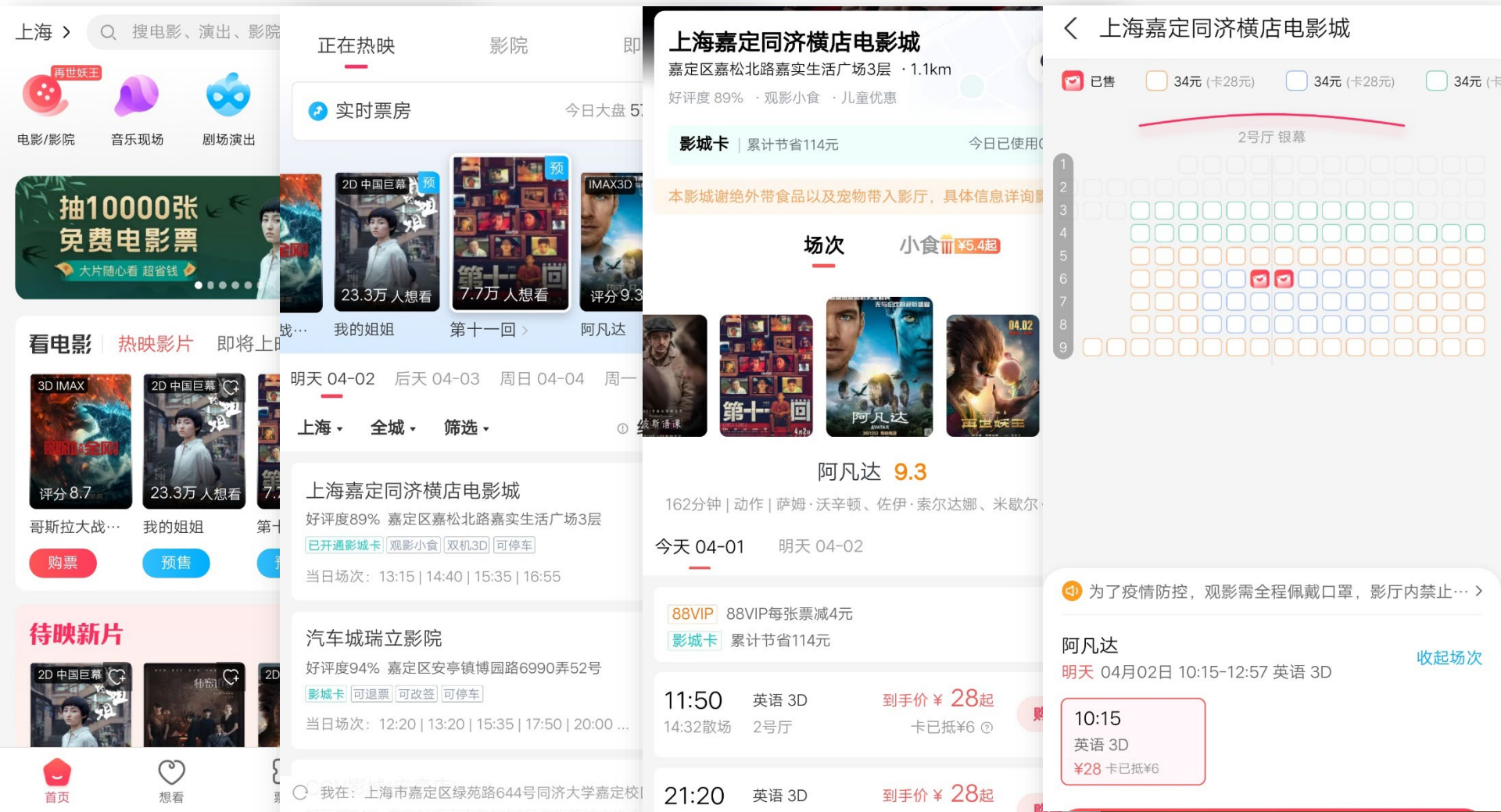
- Embedded links of webpages were first popularized in the Hypertypes system
- Highlighted names, places became menu items embedded in text

The screenshot shows the Sina.com.cn website interface. At the top left is the Sina logo and navigation menu with categories like 新闻, 军事, 社会, 国际, 体育, NBA, 英超, 中超, 博客, 专栏, 历史, 天气, 时尚, 女性, 健康, 育儿, 微博, 城市, 鲜城, 上海, 交易. Below this is a search bar with the text '大家正在搜: 讨聘礼厮打引擎警察' and a search icon. To the right of the search bar is the location '上海' with a weather icon and '14°C'. Further right is a red banner for '核心价值观 公益广告' and a blue button for '商业网站“标题党” 举报入口'. Below the navigation and search area is a horizontal menu with categories like 财经, 股票, 基金, 外汇, 娱乐, 明星, 电影, 星座, 视频, 综艺, VR, 直播, 教育, 出国, 公益, 佛学, 旅游, 文化, 彩票, 高尔夫, 理财, 科技, 手机, 探索, 众测, 汽车, 报价, 买车, 新车, 房产, 二手房, 家居, 收藏, 图片, 读书, 投诉, 司法, 游戏, 手游, 邮箱, English, 更多. Below the menu is a horizontal list of featured articles with titles like '装修就来华夏家博会', '2018中国房企500强', '17平小窝改5居', '工长工厂装修直销惠', '老房爆改二居变三居', '优选装修好工长省心', '低价精品好房推荐', '上海低价轨交房', '开年装修抢优惠', '装修工程款全额补贴', '小开间也能精装修', '神改造阳台变卧室', '90㎡装出大空间', '如何在国外买好房', '装修月月有补贴', '半包装修立减1000'. Below the featured articles is a red banner for '装修采购华夏家博会 3.9广告'. To the right of the banner is a navigation menu with '图片', '专栏', '热点', '新闻', '看上海', and '2018. 3. 1'. Below the navigation menu is a section titled '德龙密语' with a portrait of a man and the text '春季攻势下 如何做好投资?'. To the right of the portrait is a list of news items with images and captions: '东北暴雪西安入夏', '高速上演“车歪歪”', '渔民花12万祭海'. Below the news items is a list of news items with icons and titles: '中共中央举行党外人士座谈会 习近平发表讲话', '5年两会 习近平牵挂的那些百姓“操心事”', '人民日报: 保证党和国家长治久安的重大制度安排', '如何理解我国宪法序言及其法律效力 理上网来', '马斯克发推盛赞“中国基建效率是美国100倍” 暖新闻', '高速路上的夜巡(图) 新春走基层 新时代新气象新作为', '89岁代表申纪兰: 被称中国资格最老“国会议员”', '陈毅元帅之子陈小鲁昨日辞世 对自己临终事宜早有安排'. At the bottom left of the screenshot is a URL: '=2022917&p=74dHq&ro=sm&dx=0&rt=2&ns=_IP_&ni=_IESID_&v=_LOC_&nd=_DRA_&nr'. At the bottom center is the text '演眼神杀'. At the bottom right is the text '广告'.

Navigation by selection

Choices can be presented explicitly

- Graphical techniques are an attractive way to present choices



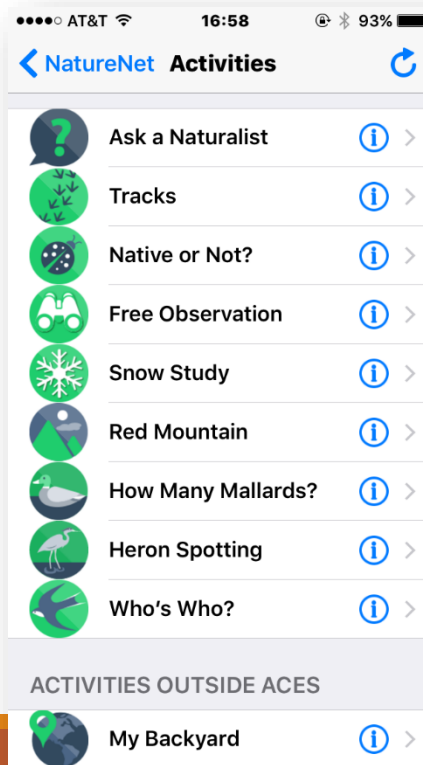
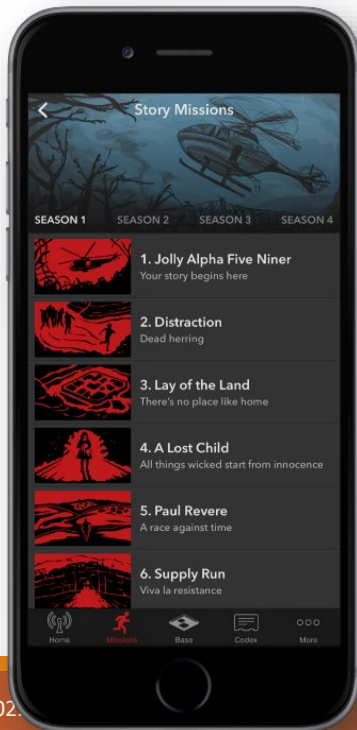
Navigation by selection

Binary menu

For an extra \$5
you can add a gift wrap
selected from dozens of choices

Add gift wrap No thanks

Grid menu





Navigation by selection

Series of choices

- Radio Buttons and Checkboxes

Does anyone in your household currently smoke?

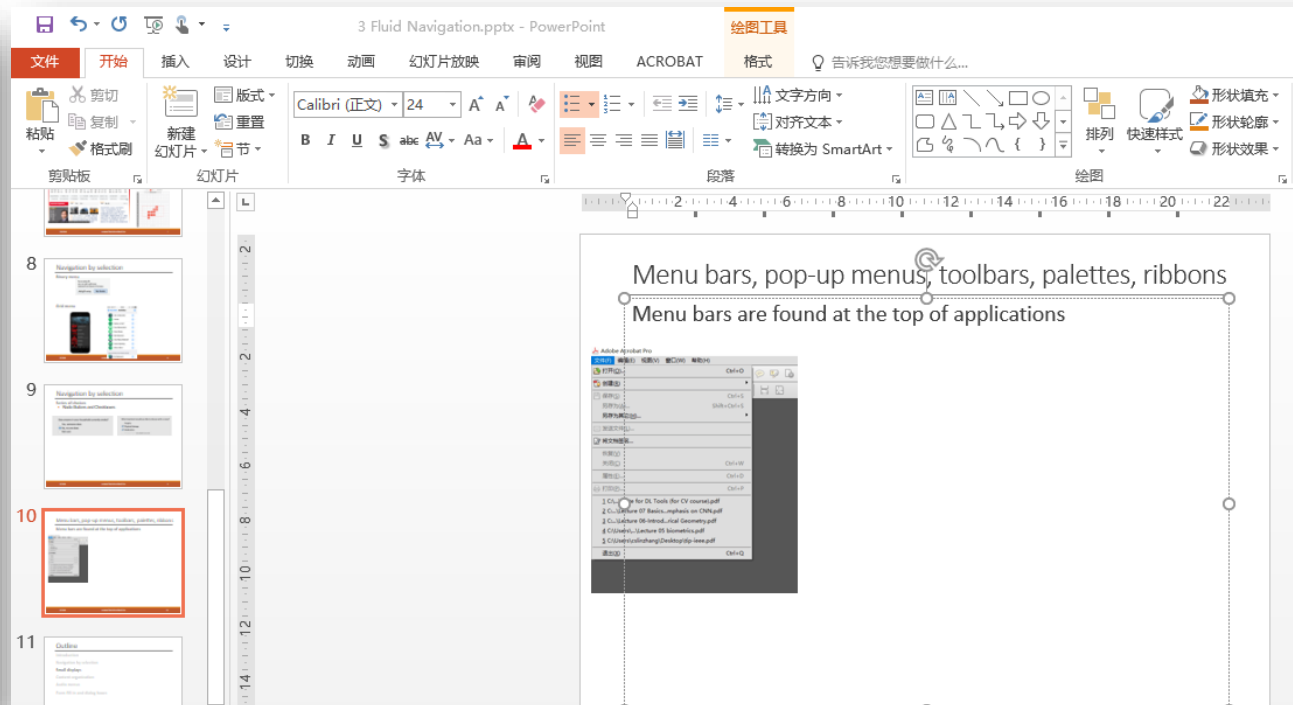
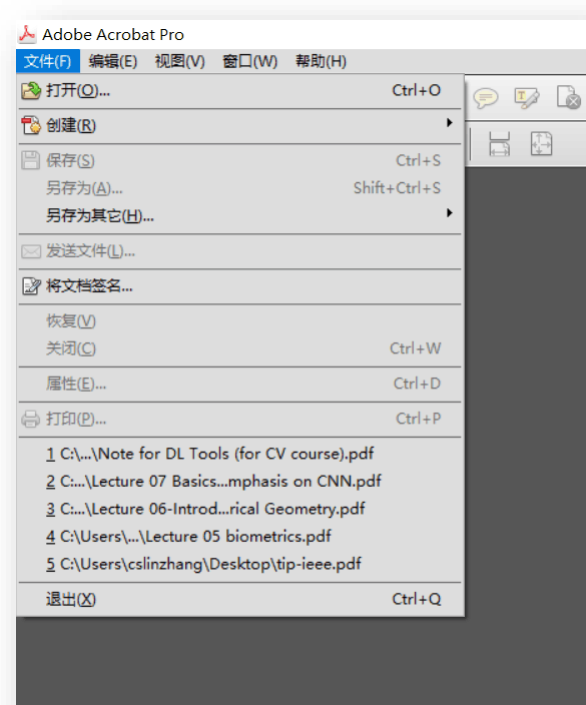
- Yes, someone does
- No, no one does
- Not sure

What treatment would you like to discuss with a nurse?

- Surgery
- Physical therapy
- Medication
- Acupuncture (not available in your area)

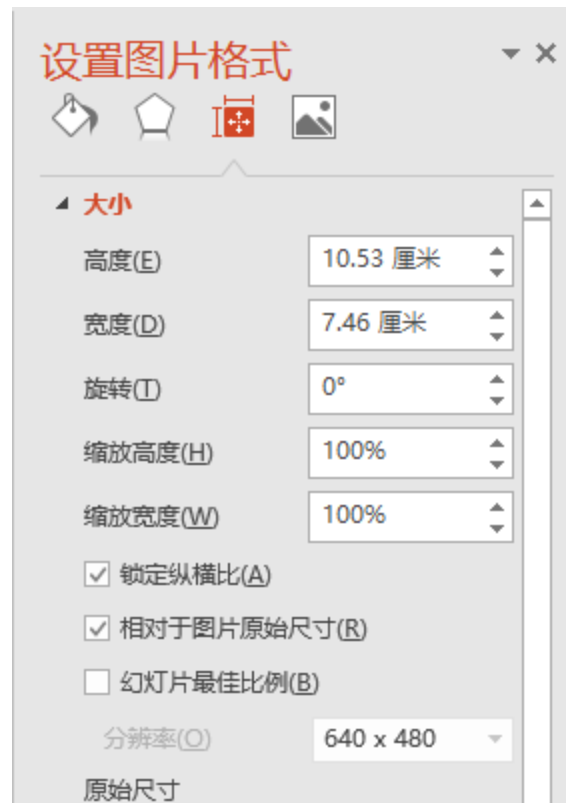
Menu bars, pop-up menus, toolbars, palettes, ribbons

Menu bars are found at the top of applications or both at the top and on the side of the screen



Menu bars, pop-up menus, toolbars, palettes, ribbons

Palettes are displayed on right or left and is mainly used to color the screen or modify the window and several icons are present on the window.



Menu bars, pop-up menus, toolbars, palettes, ribbons

Accordion menus

- Advantages: Users don't have to scroll too far to find submenu items
- Disadvantages: When the menu structure is too deep, it's not easy for users to find the target item



Menu bars, pop-up menus, toolbars, palettes, ribbons

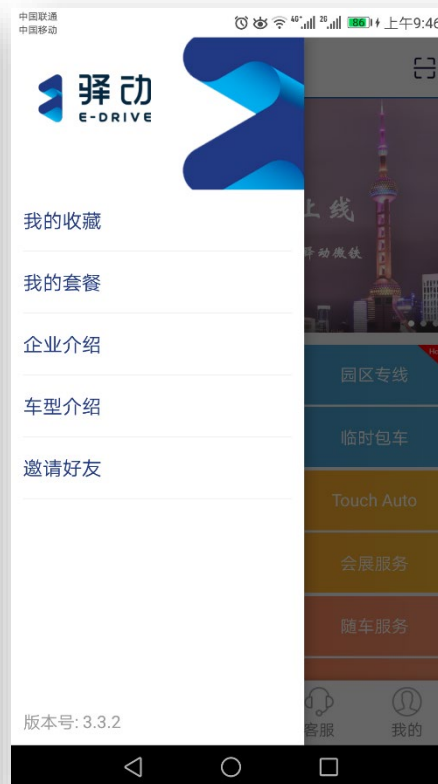
Large submenus are expanded below or to the side



Menu bars, pop-up menus, toolbars, palettes, ribbons

The limited screen space of mobile devices leads to limited items

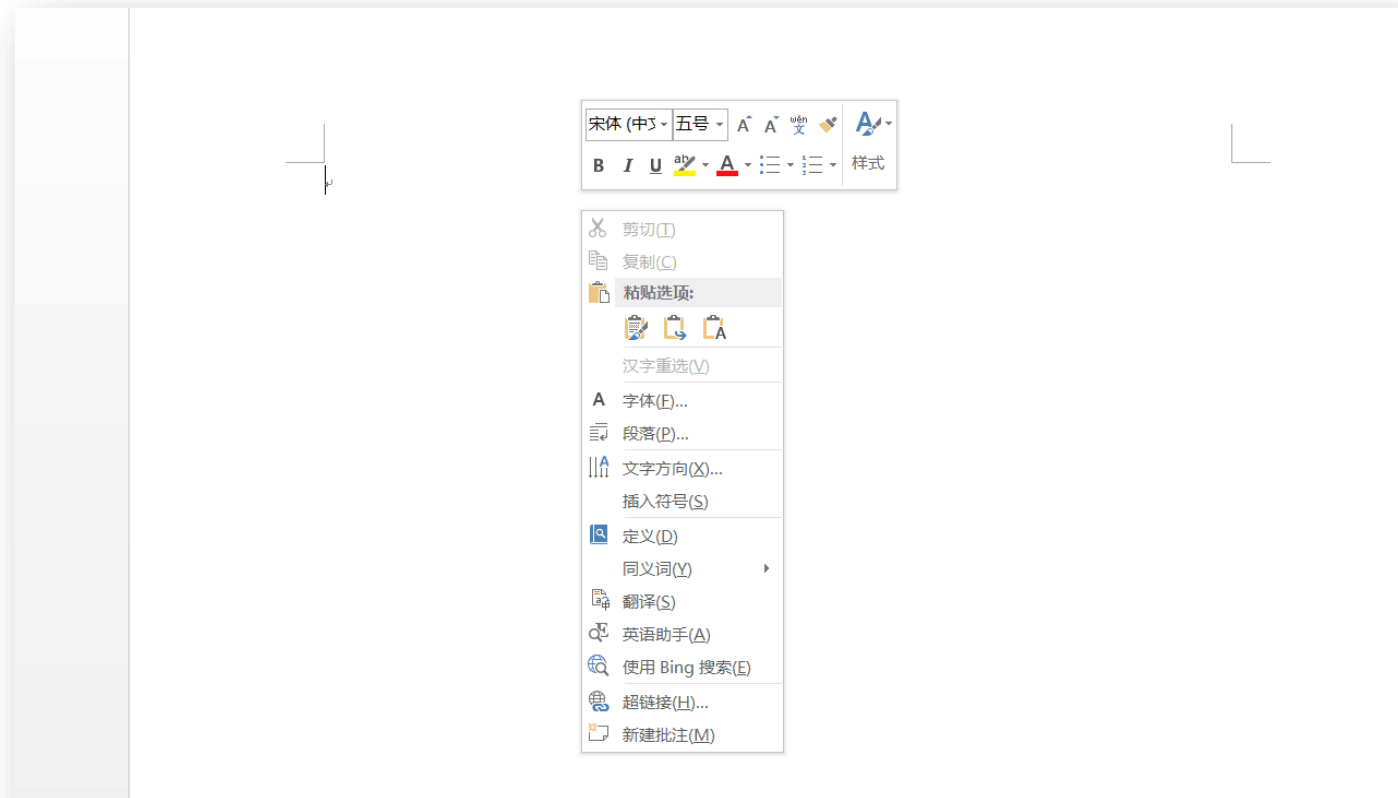
Menu items are moved into a separate screen that is accessible from a main menu icon  (*hamburger menu icon*)



Menu bars, pop-up menus, toolbars, palettes, ribbons

Pop-up menus appear when clicking or tapping with a pointing device

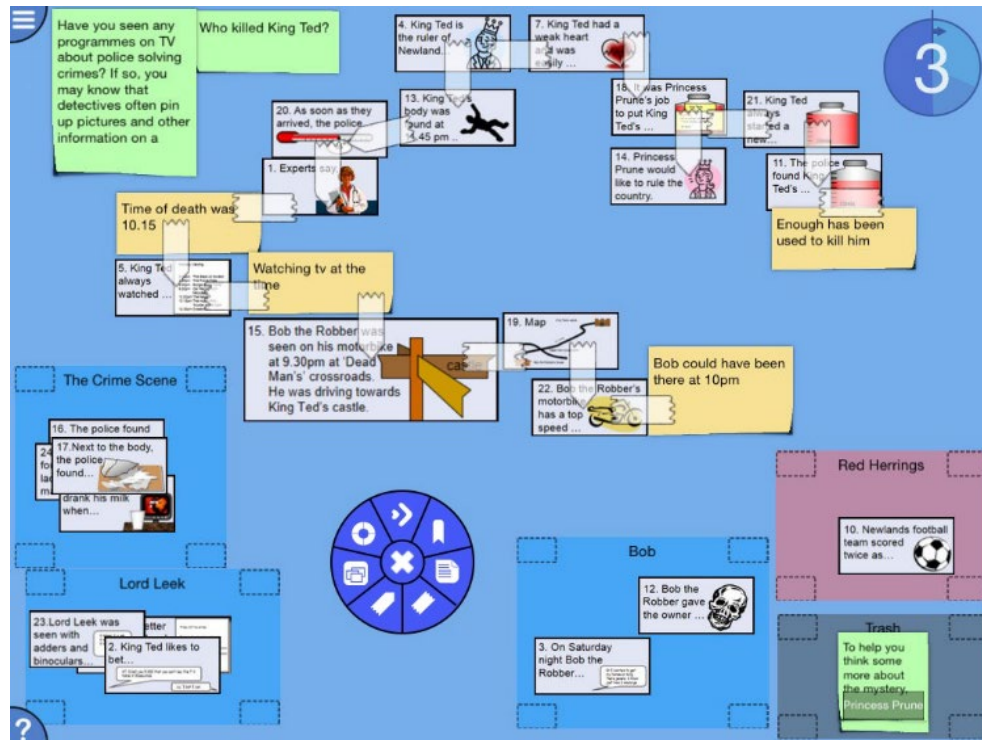
When the content of the pop-up menu depends on the cursor position, it is called a **context menu**



Menu bars, pop-up menus, toolbars, palettes, ribbons

Pop-up menus can also be organized in a circle to form *pie menus*

- Advantages: The average distance to travel to select an item is smaller than linear menus

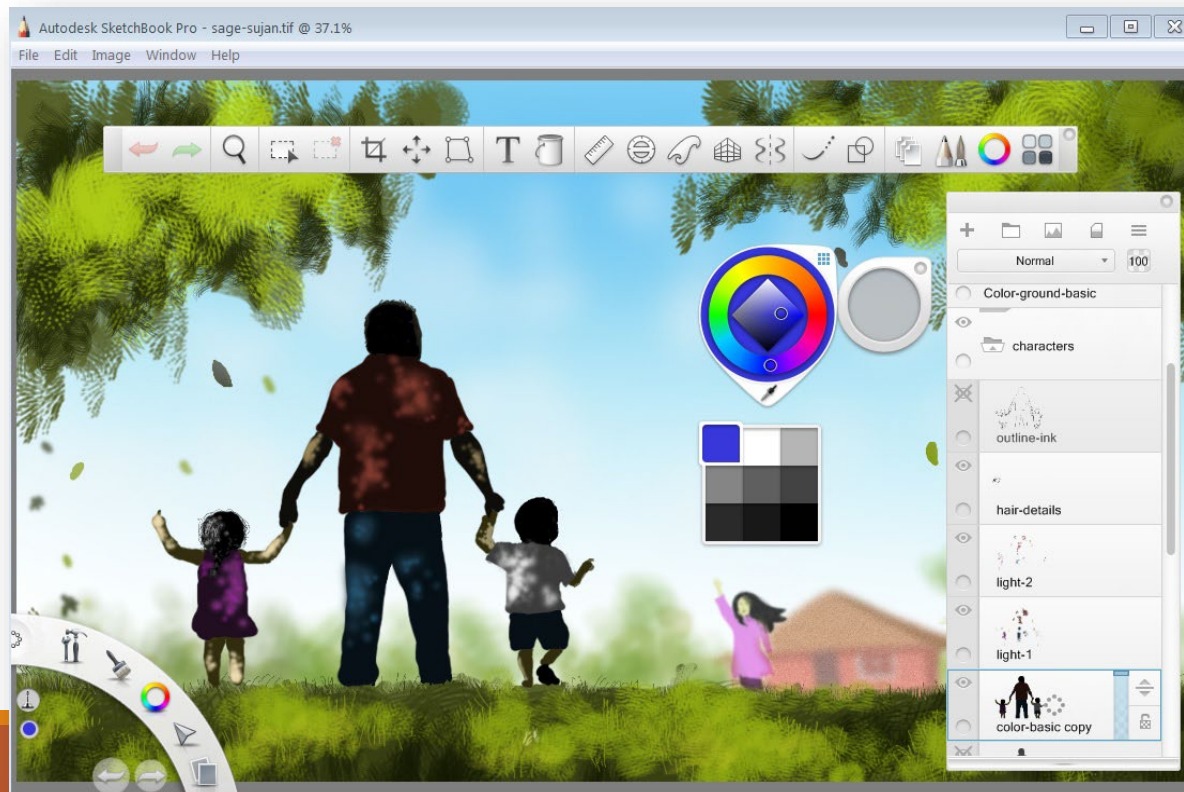


Menu bars, pop-up menus, toolbars, palettes, ribbons

Toolbars, iconic menus, and palettes can offer many actions that users can select with a click and apply to a displayed object

Users need to be able to customize toolbars

- Users can eliminate most or all the toolbars and palettes to conserve screen space
- Experts can have dense menus with many small icons



Menu bars, pop-up menus, toolbars, palettes, ribbons

Ribbons were introduced in Office 2007

Ribbons attempt to replace menus and toolbars by one-inch tabs grouping commands by task



Shortcuts and gestures for rapid interaction

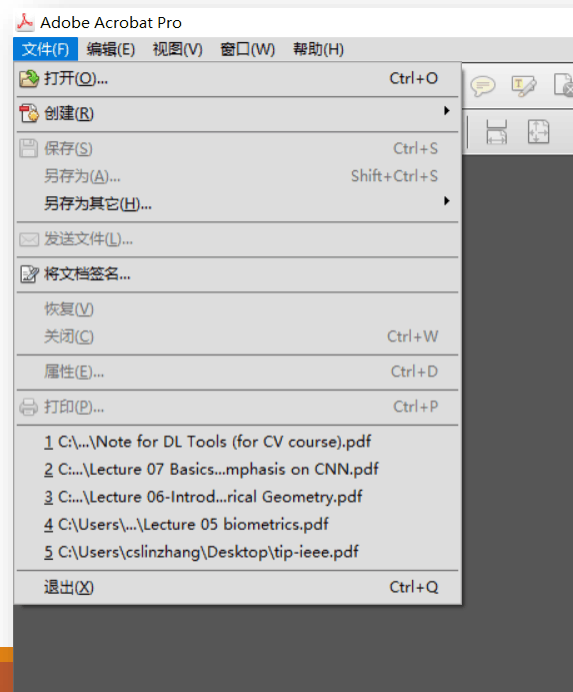
Keyboard shortcuts/hotkeys are essential for expert users

- Ctrl-C, Ctrl-V, etc

The first letter of the command is often used for the shortcut

Shortcuts should be used consistently across applications

Learning shortcuts is one useful way to reaching expert performance





Shortcuts and gestures for rapid interaction

Since typing keyboard shortcuts become impractical with touchscreen devices, gestures often serve as a shortcut for rapid selection

Gestures can be hard to discover and learn and have few or no affordances

Careful design and use of gestures can lead to fluid navigation for expert users but cause frustration when actions are triggered inadvertently

Allowing users to customize the gestures may help users remember them and provide better accessibility

Shortcuts and gestures for rapid interaction

Examples of common gestures and their effect:

- Tap: select
- Long press: varied, from magnified cursor (iOS) to showing a tooltip (Windows 8)
- Double tap: varied, e.g. zoom (iOS)
- Small swipe: varied, e.g. move location or order of objects, reveal a delete button
- Large swipe: usually scroll
- Rapid swipe or fling: fast scroll with inertia
- Pinch and spread: zoom in and out
- Variation with two or more fingers: varied effects

Long lists

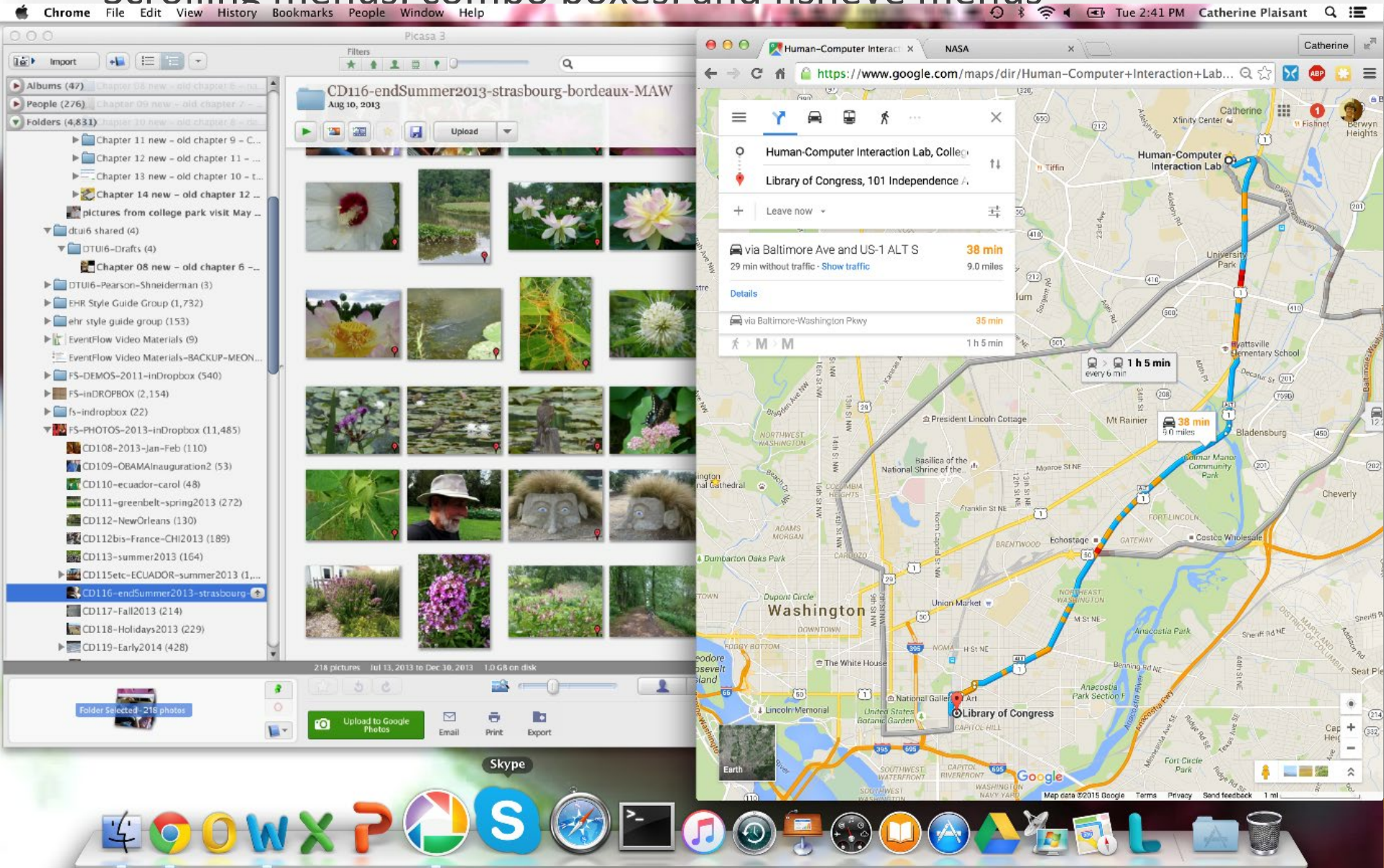
Sometimes the menu items may be too long to be displayed

A common solution is to create a tree-structured menu

Typical lists are alphabetically ordered, but categorical lists may be useful

Long lists

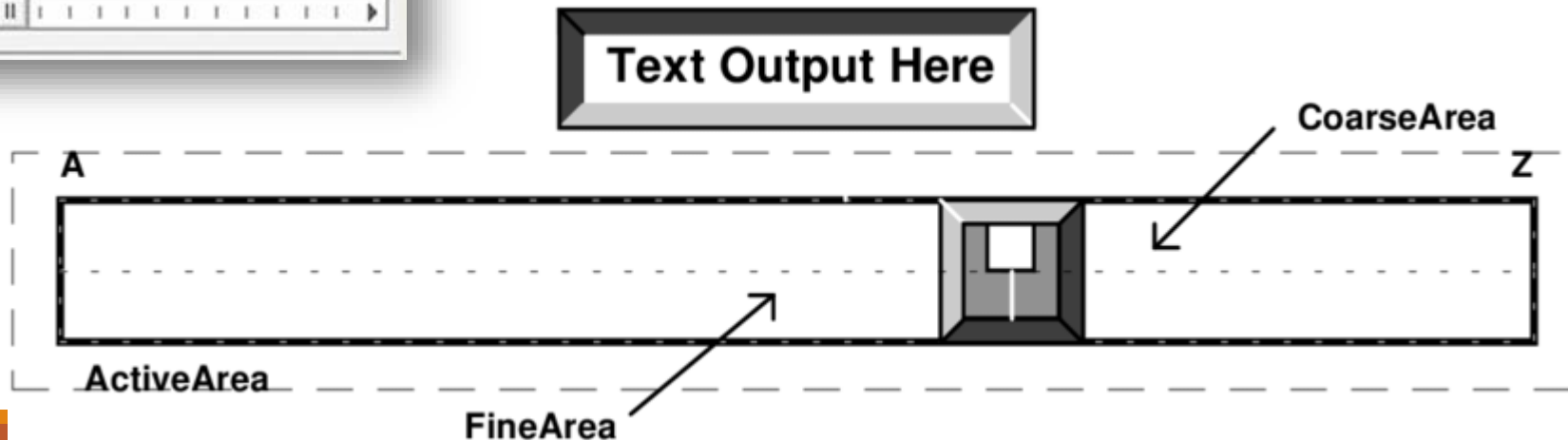
Scrolling menus, combo boxes, and fisheye menus



Long lists

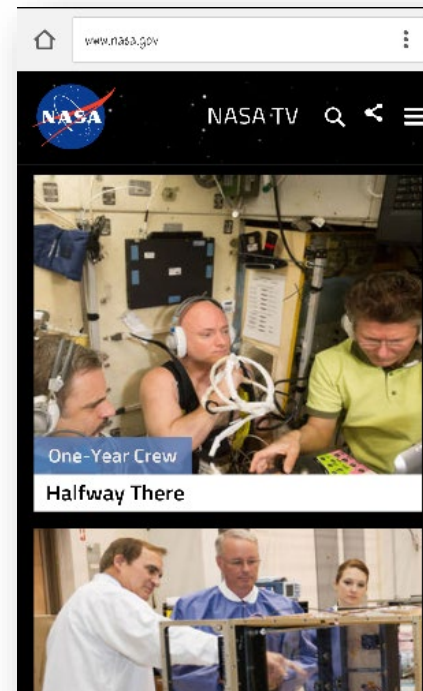
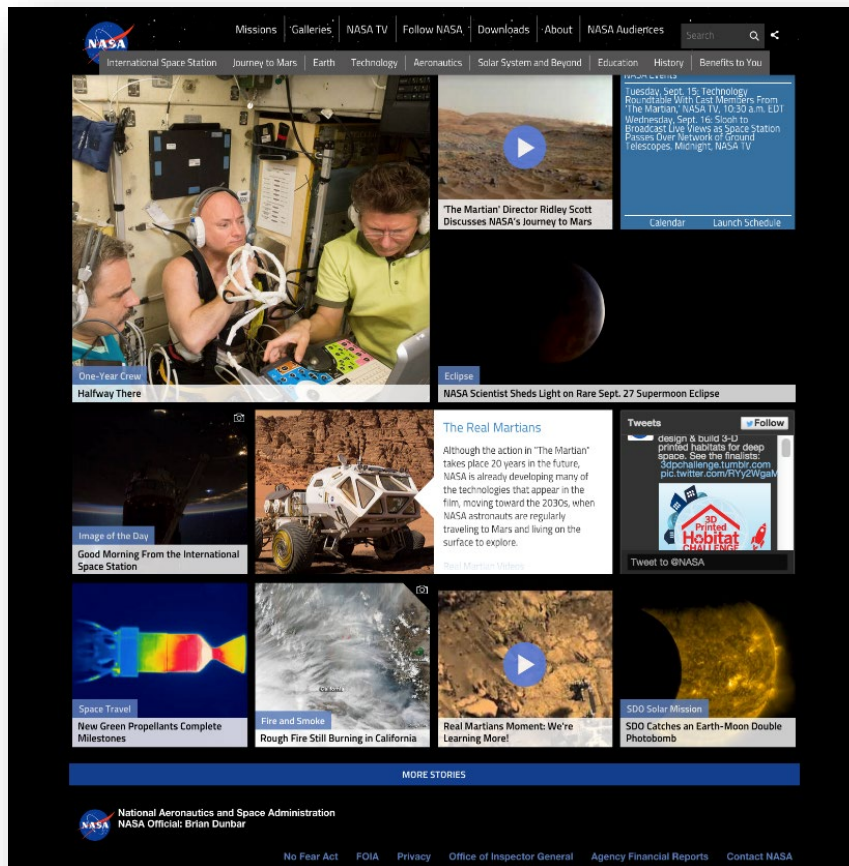
Sliders and alphasliders

- When items consist of ranges or numerical values, a slider is a natural choice to allow the selection of a value
- The alpha-slider uses multiple levels of granularity in moving the slider thumb and therefore can support tens or hundreds of thousand of items



Long lists

Two-dimensional mega menus give users a good overview of the choices, reduce the number of required actions, and allow rapid selection



Long lists

Some designers choose the more sober style of a text-only large 2D menu

- Allow users to rapidly scan hundreds of choices
- Appealing for websites with little or no competition
- A site map



Long lists

Tag clouds

The screenshot shows the Awwwards website interface. At the top left is the Awwwards logo. To the right is a green button labeled "SUBMIT YOUR SITE" and a black menu icon. Below the logo is a navigation bar with dropdown menus for "Site of The Day", "Category", "Tag", "Color", and "Country". To the right of these are icons for a grid, a list, a speech bubble, and a mobile device. The main content area is a tag cloud of buttons, each representing a design trend with its count in parentheses. The buttons are arranged in five rows. The first row includes HTML5 (730), Clean (592), CSS3 (573), Animation (480), Responsive Design (474), Design (434), Fullscreen (372), jQuery (363), and Minimal (339). The second row includes Typography (291), Video (264), Big Background Images (261), Portfolio (251), Unusual Navigation (251), Infinite Scroll (214), and Single page (211). The third row includes Photography (199), Flexible (195), Colorful (188), Parallax (148), Graphic design (146), Scroll (136), Wordpress (113), Trend (92), and Flat Design (91). The fourth row includes Social Media (89), Bright (83), Texture (81), WebGL (80), Navigation (79), Icons (76), Retro (46), Vector (40), SVG (37), and E-Commerce (34). The fifth row includes CMS (23), App Style (20), Drupal (13), Horizontal Layout (11), CSS Framework (9), Web Fonts (9), WebSocket (7), SEO (3), and a (*) Popular tag.

AWWARDS®

SUBMIT YOUR SITE

Site of The Day ▾ Category ▾ Tag ▲ Color ▾ Country ▾

HTML5 (730) Clean (592) CSS3 (573) Animation (480) Responsive Design (474) Design (434) Fullscreen (372) jQuery (363) Minimal (339)

Typography (291) Video (264) Big Background Images (261) Portfolio (251) Unusual Navigation (251) Infinite Scroll (214) Single page (211)

Photography (199) Flexible (195) Colorful (188) Parallax (148) Graphic design (146) Scroll (136) Wordpress (113) Trend (92) Flat Design (91)

Social Media (89) Bright (83) Texture (81) WebGL (80) Navigation (79) Icons (76) Retro (46) Vector (40) SVG (37) E-Commerce (34)

CMS (23) App Style (20) Drupal (13) Horizontal Layout (11) CSS Framework (9) Web Fonts (9) WebSocket (7) SEO (3) (*) Popular

Linear versus simultaneous presentation

A sequence of interdependent menus can be used to guide users through a series of choices

- Pizza-ordering interface
- Installation wizards

Linear versus simultaneous presentation

A sequence of interdependent menus can be used to guide users through a series of choices

- Pizza-ordering interface
- Installation wizards

Simultaneous menus presentment menus at the same time

- Faceted search menus

The screenshot displays the Tongji University Library search results page for the query 'bioinformatics'. The interface features a dark blue header with the library logo and name, a search bar containing 'bioinformatics', and navigation links for '重新检索' (Re-search) and '高级检索' (Advanced search). On the left side, there are faceted search menus for '限定显示范围' (Limit display range), '内容类型' (Content type), and '出版时间' (Publication time). The main content area shows three search results, each with a '在线' (Online) tag, a book icon, the title 'Bioinformatics', the author, the year, and the format '电子书: 在线全文' (E-book: Online full text). Each result also includes a '更多信息' (More information) link.

限定显示范围

- 在线全文
- 学术资料 (包括同行评审内容)
- 纸本馆藏目录

内容类型

- 期刊文章 (689,407)
- 会议录 (143,291)
- 书籍章节 (86,594)
- 报纸文章 (77,747)
- 书籍 / 电子书 (10,853)
- 更多.....

出版时间

从 [] 到 []

最近12个月
最近3年
最近5年

1 在线 Bioinformatics
著者 [edited by David Edwards, Jason Stajich, David Hansen](#)
2009
电子书: 在线全文
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2 在线 Bioinformatics
著者 [by Jeremy Ramsden](#)
2009
电子书: 在线全文
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3 在线 Bioinformatics
著者 [by Volker Sperschneider](#)
2008
电子书: 在线全文
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Small displays

Small devices have very focused functionalities and few selectable areas.

The smaller the screen, the more temporal the interface becomes

- Linear sequences of menus

Discoverability is often an issue



Small displays

Design considerations for small displays:

- Simplify: “less is more”
- Strive to reduce or eliminate data entry
- Learnability is key
- Consider use frequency and importance
- Plan for interruptions
- Use of contextual information
- Make clear what is selectable and what is not
- Leave room for scroll and swipe gestures to avoid inadvertent actions
- Consider relegating less important functions to other platforms

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Content organization

Organizing menus in a meaningful structure results in faster selection time and higher user satisfaction

Menu items should be organized by categories and have understandable meanings

- Comprehensible and distinctive



Content organization

Organizing menus in a meaningful structure results in faster selection time and higher user satisfaction

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Approaches:

- Linear sequence (e.g. in a wizard or survey)
- Hierarchical structure that is natural and comprehensible (e.g. a store split into departments)
- Network structure when choices may be reachable by more than one path (e.g. websites)

Structure and breath versus depth

Categorize similar items using *tree structures*

- Tree-structured menus are suitable to novice or intermittent users

Rules for forming menu trees:

- Use task semantics to organize menus
- Limit the number of levels (i.e. prefer broad–shallow to narrow–deep)
- Create groups of logically similar items: e.g. Level 1: countries, Level 2: states, Level 3: cities
- Form groups that cover all possibilities: e.g. Age ranges: [0–9] [10–19] [20–29] and [\geq 30]
- Make sure that items are non-overlapping: e.g. use “Concerts” and “Sports.” over “Entertainment” and “Events”
- Arrange items in each branch by natural sequence (not alphabetically) or group related items
- Keep ordering of items fixed (or possibly duplicate frequent items in dedicated section of the menu)

Structure and breath versus depth

If the groupings are natural and comprehensible, users can easily accomplish the tasks



Use the terminology from the task domain instead of using a vague title

- “Main Menu Options” vs “Friendlibank Service”

Structure and breath versus depth

Breadth vs depth

The breath is preferred over depth

Given sufficient screen space, it's better to show a large portion of the menu structure



Sequence, phrasing, and layout

Sequence

- Designer is confronted with the choice of *presentation sequence*

Some items have a natural sequence and some do not

- Categorical organization is preferred

Split menus extract three or four of the most frequently used items and put them near the top while preserving the order of the remaining items

Adaptive menus provide users with control over the sequence of menu items



Sequence, phrasing, and layout

Phrasing

- For single menus, a simple descriptive title that identifies the situation is necessary


Some directives

- Use familiar and consistent terminology.
- Ensure that items are distinct from one another
- Use consistent and concise phrasing
- Bring the keyword to the fore

文件 开始 插入 设计 切换 动画 幻灯片放映 审阅 视图

 Adobe Acrobat Pro DC (32-bit)

文件(F) 编辑(E) 视图(V) 签名(S) 窗口(W) 帮助(H)

 *new 3 - Notepad++

文件(F) 编辑(E) 搜索(S) 视图(V) 编码(N) 语言(L) 设置(T) 工具(O) 宏(M) 运行(R) 插件(P) 窗口(W)



Sequence, phrasing, and layout

Layout

- Techniques to indicate position in the menu structure can be useful
- Elements included: Titles, item placement; instructions, error messages

As the user goes down the tree structure, the titles can be designed to indicate the level or distance from the main menu

- Graphics, fonts, typefaces, or highlighting techniques can be used beneficially

BROWSE BY TOPIC

Sports, Recreation & Leisure

Baseball

Baseball Cards 1887-1914

Outline

Introduction

Navigation by selection

Small displays

Content organization

Audio menus

Form fill-in and dialog boxes

Audio menus

Audio menus are useful in *interactive voice response*(IVR) systems

With audio menus, instruction prompts and options are spoken to users

- Audio menus have to provide a confirmation step following the selection
- To reduce dependence on short-term memory, it is preferable to describe the item first and then give the number
- A way to repeat the list of options and an exit mechanism must be provided




Audio menus

Complex and deep menu structures should be avoided

- The number of choices should be less than three or four

To develop successful audio menus, it is critical to know the users' goals, make the most common tasks easy to perform rapidly, and keep prompts to a minimum

- 'Listen carefully, as our menu options have recently changed' 
- More in Chapter 9



Outline

Introduction

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Form fill-in and dialog boxes

Form fill-in

This form fill-in allows users to enter information when joining the IEEE Society

- Fields are grouped meaningfully, and field-specific rules such as password requirements are provided next to the fields
- The data is validated as soon as it is being provided and error messages explain how to correct the problem

Create an IEEE Account ? X

*** Required field**

Provide your personal information

*** Given/First name:**

Middle name:

*** Last/Family/Surname:**

Enter email address & password

The email provided here will be the username of your account.

*** Email address:**

*** Re-enter email address:**

*** Password:**

*** Confirm password:**

! > The email address provided is not in a valid email format (for example: j.doe@nomail.com). Please try again.

✓ Your password is good

Passwords must be between 8 and 64 characters, and include at least one number. [More...](#)

[> Privacy & Opting Out of Cookies](#)

[Create account](#) [> Cancel](#)

Form fill-in

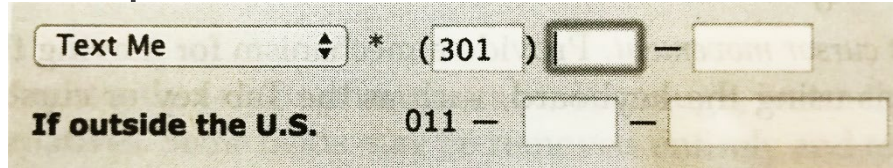
Form fill-in design elements

- Meaningful title
- Comprehensible instructions
- Label the field
- Limit data entry
- Explanatory messages for fields
- Error prevention
- Error recovery
- Immediate feedback
- Logical grouping and sequencing of fields
- Visually appealing layout of the form
- ...

Format-specific fields

Some common fields

- Telephone numbers



Text Me * (301) [] - []
If outside the U.S. 011 - [] - []

- Dates

Date: _ _ / _ _ / _ _ _ _ (04/06/2018 indicates April 6, 2018)

- Times
- Dollar amounts

Deposit amount: \$ _ _ _ _ . _ _

- Passwords
- CAPTCHAs (Completely Automated Public Turing test to tell Computers and Humans Apart)

Format-specific fields

Some common fields

- CAPTCHAs (Completely Automated Public Turing test to tell Computers and Humans Apart)

拖動下方滑塊完成拼圖



|||

填写验证码



换一张图片

wtvb|

请选择包含
路标
的所有图块



继续

UMAN COMP



验证

52

Dialog boxes

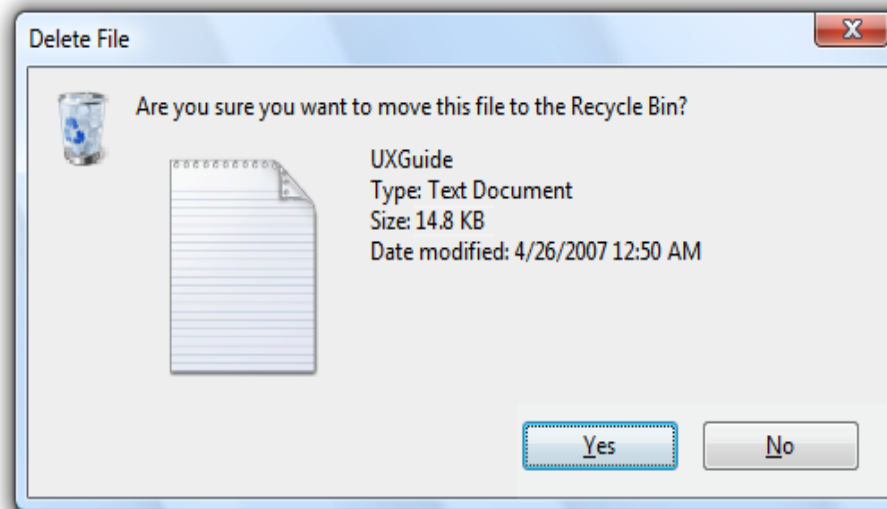
Dialog boxes are used to request users to select options, perform limited data entry, or review alerts and error messages

Dialog boxes are often shaped and sized to fit each situation, but distinctive sizes or aspect ratios may be used to signal errors, confirmations, or components of the application

Dialog boxes

This dialog box includes a binary menu with two choices (Yes or No)

- The blue highlighting on Yes indicates that this selection is the default and that pressing Return will select it
- Specific keyboard shortcuts can be made available
- Escape closes the dialog box
- Typing the letter 'N' will select 'No' as indicated by the underlined letter 'N'



Dialog boxes

This dialog box is used to alert clinicians who try to prescribe the drug Warfarin, because it increases the risk of bleeding of patients already on Aspirin

- Several possible actions are proposed
- Overriding the alert is possible but requires confirmation by clicking a check box
- Because of the severity of the alert, this is a modal dialog box and it requires immediate action

Signal Word

Provide clear visual cues and type of alerts

Nature of hazard

Provide succinct reason for the alert

Actions

Provide a list of actions to respond to the alert

User Feedback

Provide ability to capture user feedback

The dialog box is titled "WARNING! Drug - Drug Interaction". It contains the following text: "Warfarin - Aspirin", "Increased risk of bleeding", and a link to "guidelines". Below this is a section titled "Management" with three options: "Aspirin" (Keep Aspirin, do not order Warfarin), "Warfarin" (Keep Warfarin, cancel Aspirin), and "Override" (Order both Warfarin and Aspirin). The "Override" option includes a checkbox for "Confirm override" and a note: "Check INR frequently and advise patient for warning signs of bleeding". At the bottom right is a "Cancel" button. At the bottom left is a link: "Provide feedback on this alert".

WARNING! Drug - Drug Interaction

Warfarin - Aspirin
Increased risk of bleeding [guidelines](#)

Management

Aspirin Keep **Aspirin**, do not order Warfarin

Warfarin Keep **Warfarin**, cancel Aspirin

Override Order both **Warfarin and Aspirin** Confirm override
Check INR frequently and advise patient for warning signs of bleeding

[Provide feedback on this alert](#) **Cancel**