

Index

Symbols

3-D visualization 558–575
 GUI design remarks 564
 high-performance 3-D remote visualization 565
 distributed visualization service (DVS) 566
 mobile visualization client 567
 local computation 559
 remote computation 561

A

adaptive
 interfaces in mobile environments 302–317
 abstract user interface adaptation 304
 adaptation to devices 306
 design-time adaptation 306
 mobile agent adaptation 308
 run-time adaptation 307
 adaptation to users 309
 adaptive user interface system (ADUS) 309
 mobile learning management system (AM-LMS)
 286–301
 analyzing learning style 296
 structure 295
 ambient system (AmS) 369
 audio-based memory aid 1031–1048
 personal audio loop (PAL) 1032
 final prototype 1038
 formative evaluations 1033
 making PAL socially and legally acceptable
 1044
 making PAL ubiquitous 1043
 making PAL useful 1043
 usefulness of PAL 1036
 average ranked list position (ARP) 417

C

camera phones in social contexts 55–68
 barriers to sharing 64
 situated use 58
 social uses 60

cognitive models as usability testing tools 814–829
 architectures 820
 goals, operators, methods, and selection rules
 (GOMS) 821
 descriptive vs. generative models 822
 atomic component of thought with rational
 analysis (ACT-R) 823
 ISO quality models 818
 collaborative learning 270, 272
 an environment for cognitive engagement 275
 mobile technology supported classroom 275
 cognitive conflict 271
 cognitive elaboration 271
 cognitive tool (CT) 271
 mobile learning 273
 pedagogical design 279
 encouraging reciprocal tutoring 281
 collaborative mobile applications
 field study 997–1014
 data analysis 1002
 through ActivityLens 1003
 data collection techniques 999
 computer
 -supported collaborative learning (CSCL) 1068
 -supported collaborative work (CSCW) 1068
 -supported intentional learning environments
 (CSILE) 1068
 context 187–204
 -aware mobile interfaces 759–779
 designing 770
 mobile use context 761
 wizard of oz evaluation 770
 for mobile applications? 192
 ontology-based model 194
 mobile context-aware applications 208
 design guidelines 212
 support for interaction design 210
 usability 209
 risks 210
 perils of context-awareness 191
 supporting user interaction 197
 utilisation in mobile applications 190

- what is context-awareness? 206
 - relevance to human-computer interaction (HCI) 207
 - relevance to mobile HCI 207
 - what is it? 189
- D
 - disambiguation accuracy (DA) 417
 - distraction classification 973
 - three studies 974–978
- E
 - electromyographic (EMG) 524–542
 - electrodes, recording, and applications 526
 - for human-computer interaction (HCI) 527
 - intimate communication armband 528
 - hardware 529
 - signal 526
 - subtle gestures 528
 - 1st study: learning and recognition rate 533
 - 2nd study: multimodal realistic interaction 535
 - 3rd study: assessing noticeability 537
 - model 531
 - engineering emergent ecologies 364–385
 - an example: virtual residence 372
 - bio-inspired approaches 367
 - engineering approach 373
 - AmI spheres and collective behaviour 374
 - awareness and presence 374
 - interacting with AmI spheres 374
 - GAS approach 375
 - interaction 367
 - symbiotic AmI spaces 367
 - ethnography and interface design 3
 - design sketching 9
 - informing design 5
 - interpreting data 4
 - in the design process 4
 - prototyping 11
 - experimental ethno-methods 16–34
 - experimental prototypes 25
 - public interactive display 26
 - results analysis 27
 - theatre workshops: personas and scenarios 22
 - to evaluate the user experience with mobile interactive systems 16–34
 - exploring starfield displays 576–593
 - fish-eye 583
 - interfaces 584
 - overviews+detail 580
 - interfaces 581
 - smooth-zooming 578
 - interface 578
 - extensible user-interface language (XUL) 310
 - eye movement studies of mobile readability 945–971
 - cathode ray tube (CRT) 951
 - evaluation methodology 955
 - general linear model (GLM) 956
 - liquid crystal display (LCD) 951
 - reading on small screens 951
 - study one: reading on a PDA 957
 - study three: reading on a mobile phone 963
 - study two: verifying the results 960
 - text presentation formats 952
 - the reading process 947
 - cognitive processing 948
 - measuring readability 949
 - physiological limitations 947
 - thin-film transistor (TFT) technology 951
- F
 - field laboratory for evaluating in situ 982
 - close-up video and improved sound 985
 - increasing battery lifetime 991
 - minimizing equipment 991
 - small cameras and video sources 988
 - flexible organic light emitting diodes (FOLEDs) 179
- G
 - gadgetware architectural style (GAS) 196
 - generation of GUIs (indirectly) 311
 - graphical partitioning model (GPM) 274
 - graphical user interfaces (GUIs) 302
- H
 - heuristic evaluation methods 780–801
 - appropriating usability heuristics 785
 - mobile usability issues 786
 - toward a set of heuristics 787
 - environment of mobile infrastructure 796
 - limitations 784
 - mobile devices, applications, and their context 782
 - nature of mobile devices 795
 - strengths 784
 - human-computer interaction (HCI) 731–744
 - defining evaluation targets 732
 - designing an evaluation protocol 739–740

Index

- making sense of human activity 736–737
- referent models 734
- human mobile computing performance 830–846
 - applying Fitt’s law 834
 - experiment on mobile input performance 835
 - input time and Fitt’s law 839
 - mobility and HCI 832

I

- in-car user-interfaces 218–236
 - case study: vehicle navigation systems 229
 - design and evaluation 223
 - 15 second rule 228
 - field trials 224
 - keystroke level model (KLM) 228
 - lane change task 228
 - peripheral detection task 227
 - road trials 225
 - simulator trials 225
 - human-centered design process 220
 - environments 223
 - equipment 222
 - tasks 221
 - users 220
 - types of in-car computing systems 219
- individuals with disabilities 609–623
 - design of assistive technologies 613
- instrumented usability analysis 928
 - case study of walking and tapping 931
 - example: mobile text entry 930
 - the Hilbert transform 934
- intelligent user interfaces (IUIs) 318–329
 - artificial intelligence (AI) in mobile computing 322
 - artificial intelligent (AI) in mobile computing techniques 323
 - reflections on context 320
 - device characteristics 321
 - prevailing environment 321
 - social situation 322
 - the intelligent agent paradigm 324
- interface definition language (IDL) 369

K

- keystrokes per character (KSPC) 417

L

- language understanding 469
- learning-disabled children 142
 - method 144

- participants’ experience with technology 146

M

- media services language (MSL) 658
- micro-electrical-mechanical systems (MEMS) 160
- mobile
 - applications and mental health 635–656
 - adaptable systems 646
 - case study: “mobile mood charting” 649
 - design of chart 650
 - design 638
 - for adolescents 639
 - for therapists 639
 - design recommendations 644
 - multistage prototyping 647
 - software to support psychotherapy 640
 - supporting mental health interventions 637
- camera-based user interaction 543–557
 - computer vision technologies 544
 - markerless tracking 545
 - tagging-based systems 546
 - mapping camera motion 547
 - prototype 550
 - applications 551–553
 - high-level algorithm description 550
- collaboration in learning environments 1069
 - collaboration components 1074
 - paper prototype testing 1070
- design for older adults 624–634
 - meetings/discussions 628
 - physical interfaces 629
 - recruiting older target populations 627
 - virtual interfaces 630
- devices as museum guides 256
 - example of mobile activity design 262
- evaluations in a lab environment 910–926
 - distractions 913
 - evaluation 1: audio and visual navigational cues 914
 - evaluation 2: comparison of wearable displays 919
- learning 287
 - environment 288
 - research trends 289
 - styles 290
 - four dimensions 291
 - index of learning style (ILS) 292
 - user interface 294
- learning in museums 253–269
- mixed systems 346
 - 3-D simulation environment 349

- ASUR model 350
 - basic principles 350
 - extension 351
- designing 348
- SIMBA 354
 - element model 355
 - overall process 354
 - simulation 358
- telephones for rendezvousing 35
 - a diary study 37
 - method 38
 - performance deficits: user experience 43
 - results 39
 - design implications 45
- model-based sonification 481
- doppler effect 483
- experiments
 - one 485–491
 - two 493–503
- human operator modeling 499
- quickenings 482
- multilayered evaluation approach 850
 - experiment: comparing field and laboratory use of a PDA 851
 - WebQuest Tool 854
- multimodal user interface (MUI) 462
- multiplatform e-learning systems 1083
 - evaluation methodology 1086
 - overall learner satisfaction score 1090
 - participants information 1089

N

- navigational aid for blind pedestrians 693–710
 - aids 694
 - user- and activity-centered approaches 695
 - activity-centered approach 699
 - user-centered approach 697
- nonspeech audio 676–692
 - advantages of using our ears 676
 - benefits 678
 - ecological psychology approach 678
 - experimental process 680
 - sound localization process 679
 - spatial conceptualization process 684
 - experiments 686
 - virtual courses 685
 - virtual 3-D acoustic space 679

O

- one-handed use of mobile devices 86–101
 - field study 88
 - thumb movement study 93
 - design 94
 - equipment 93
 - Web survey 90
- optical fiber flexible display (OFFD) 178

P

- photo management on a mobile device 69–85
 - designing mobile interface 75
 - enhancing interaction 77
 - context-awareness 78
 - online photoware for sharing and photoblogging 73
 - photo browsing techniques 76
 - stand-alone photoware 73
- privacy regulation model 863–876
 - case study: privacy perception of the PePe system 869
 - five factors affecting information disclosure 866–868
 - previous research 865
- projected displays for collaboration 594–608
 - Hotaru (Firefly) 595
 - intuitive manipulation techniques 599–601
 - examples 600
 - of mobile devices 596
 - user studies 601
 - experiment 1 602
 - experiment 2 603
- prototyping tools 330–345
 - building a high fidelity prototype 341
 - SUEDE 330
 - topiary 330
 - with storyboards 332
 - wizard of oz (WOz) testing 335

Q

- question-answer relationships (QAR) 1069

R

- radio frequency identification (RFID) technology 657
 - application fields 660
 - EuroFlora guide 664
 - structure of the interface 666
 - integration of RFID subsystem 662

Index

- MADE support 659
 - location-aware computing 659
- mobile applications development environment (MADE) 658
 - architecture 660
- S
- smart
 - garments
 - applications 184
 - embedded technologies 179
 - microprocessors 179
 - power, radiation, and the environment 180
 - ergonomics of intelligent clothing 180
 - aesthetics vs. function 182
 - cut, connectors, and material 181
 - wheelchair
 - adaptability 717
 - alternative navigation models 724
 - behaviour-based interaction 725
 - physical interface 722
 - structure 712
 - user interface 713
 - design constraints 714
 - what is it? 712
 - wheelchairs 711–730
 - speech-based user interfaces (UI) 237
 - automotive UI design principles 239
 - recommendations 240
 - recent automotive spoken UIs 242
 - speech-in list-out approach (SILO) 245
 - speech-centric user interface design 461–477
 - generic MUI architecture 463
 - modality fusion 470
 - special considerations for speech modality 465
 - context-aware language model 469
 - modality switching 468
 - resource constrained speech recognition 466
 - speed-dependent automatic zooming (SDAZ) 589
 - stroke-based input 426–445
 - Chinese characters 427
 - mobile input solutions 428
 - handwriting recognition 428
 - pinyin method 428
 - structure-based methods 429
 - Motorola iTap™ stroke input method 430
- T
- technology acceptance model (TAM) 103
 - for mobile services (TAMM) 106
- text entry 408–425
 - disambiguation 412
 - evaluation 417
 - keyboards 409
 - ambiguous 411
 - unambiguous 409
 - stylus-based 414
 - gesture-based input 416
 - handwriting 415
 - on-screen keyboards 414
- tourist digital assistant (TDA) 658
- transgenerational designs 122–141
 - assessments 126
 - implications for design 135
 - independent and dependent variables 124
 - learnability effects 131
 - menu navigation performance 130
- U
- ubiquitous mobile input 386–407
 - design space of input devices 387
 - orient 394
 - positioning tasks 388
 - continuous direct interactions 390
 - continuous indirect interactions 388
 - discrete direct interactions 391
 - discrete indirect interactions 391
 - positioning techniques 392
 - spatial layout of design space 401
 - text 399
- UI design in a closed environment 1015
 - competing technologies 1019
 - participatory design 1023
 - patient monitoring unit (PMU) 1017, 1025
 - physiological monitoring 1018
 - strategic user needs analysis (SUNA) 1020
 - steps 1021
 - usage context 1017
 - user-centred design (UCD) 1019
- unobtrusive movement interaction 507–523
 - continuous detection reliability: experiments 514
 - customization 511
 - sensor interaction cover 511
 - use cases and usability 513
- usability
 - evaluation methods (UEMs) 745–758
 - case study: towards a real world lab 752
 - current UEM framework 747
 - cultural probes 750
 - for mobile applications 746
 - factors of mobile phones 877–896

- case studies 890–892
- developing a framework 881
- hierarchical model of impact factors 883
- phones and tasks 879
- user acceptance of mobile services 102–121
 - applicability of earlier approaches 105
 - design implications 110
 - perceived ease of adoption 116
 - perceived ease of use 112

V

- validity laboratory test results 897–909
 - challenges of mobility 899
 - suggestions for field testing 904
 - logistics 905
 - usability testing 900
 - principles 900
- visualising meeting recordings on small screens 1052
 - meeting browser evaluation test (BET) 1057
- voice-enabled user interfaces 446–460
 - the prototype 448
 - managed applications 450–454
 - program manager 454
 - graphical user interface (GUI) 454
 - underlying speech technology 449
 - speech recognition 449
 - speech synthesis 450

W

- W3C device independence activities 1082
- wearable computers 158–175
 - computer response to physical activity 164
 - emotional impact 168
 - finding and retrieving information 166
 - human factors 158–175
 - form-factor and physical attachment 160
 - navigation and wayfinding 165
 - perceptual impacts 163
 - physical effects 161
 - reducing size and separating components 162
 - supporting memory 165

- wizard of oz for evaluating 802–813
 - in the development lifecycle 804
 - method 803
 - studies for mobile technology 805
 - variability 806
 - wozzing 806
 - cautions 810

Z

- zoomable user interface (ZUI) 577