

智能时代人机交互的一些思考

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2

1960 Licklider [2] (man-computer symbiosis)
ACM 1992 (association for computing machinery,
(special interest group on computer-human interaction, SIGCHI)

[3]. 1999 “ ” 21
4 . 2007 (national science foundation, NSF)
(information and intelligent systems, IIS) 3

7 . 2012
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100 , 25 1).
Massachusetts Institute of Technology Carnegie Mellon University Stanford University
Microsoft Google

Bill Gates “ ”

[4]. 20

1) <http://www.hcibib.org/>.

, [3], , .
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3

3.1

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. 1945 , Bush ^[5] Memex,

ENIAC .

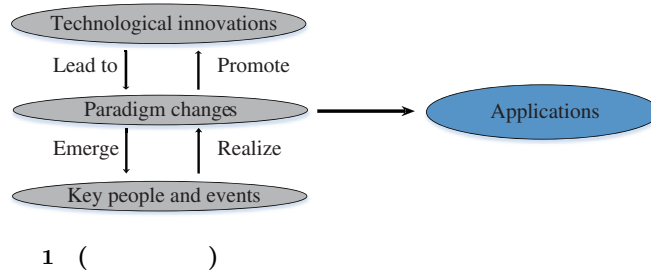


Figure 1 (Color online) Relationship among the innovation of technology, the change of paradigm, and key people and events

WIMP [12], Post-WIMP [11], Non-WIMP [12], PIBG (physical object, icon, button, gesture) [13], (tangible user interface) [14], (radical atom) [15].

3.2

Card [17], (the model human processor, MHP) GOMS (goals, operations, methods, selection rules) MHP, GOMS, GOMS, GOMS, GOMS, GOMS (task-action grammar, TAG) [18]. SOAR, [19]. ACT-R, [20], [21]. EPIC

[22].
MHP, GOMS, SOAR, ACT-R, EPIC

3.3

(user interface, UI)
[23]. 3 (batch interface, BI)
(command line interface, CLI) (graphical user interface, GUI). BI

CLI ,
GUI . GUI

, GUI
(natural user interface, NUI) . NUI
()

(affordance) (paradigm) 3 (user experience) 4 (metaphor) 2

WIMP

[24, 25],

[26].

[27]

[28]

[29].

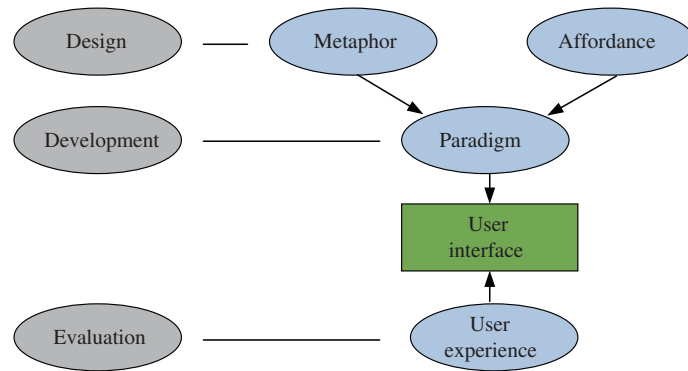


Figure 2 (Color online) User interface framework

Norman [30]. Norman [31]. Fitts [32, 33]. Hick [34]. 7 2 [35].

3.4

Nickerson: “...”. Ritter [36]. ABCS (anthropometrics, behavior, cognition, social factors). ABCS 4. ABCS ABCS [37]. ACM SIGCHI 2005 “ ”

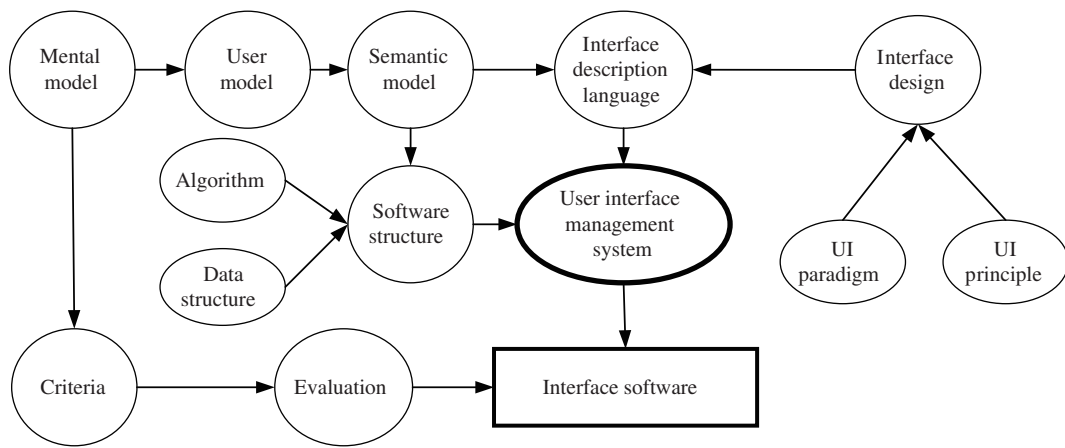


Fig e 3 HCI research framework

4

4.1

[40].

20 90 , Mann [41] CLI
 GUI , “ ” “ ” “ ”. 2008
 “ ” , Microsoft August NUI CLI GUI
 . 2010 , Wigdor Wixon [40]
 [42].

Microsoft PixelSense Xbox Kinect Edusim 3D Immersive Touch Jefferson Han Perceptive Pixel
 Labs MYO . Thalmic

4.2

(reality-based interaction, RBI)

RBI , [43]. RBI
 , 4 [11]. 4 :
 ; 2
 ; 3
 . RBI
 . Flying Kite RBI
 RBI
 [44].

4.3

(technology-mediated social participation, TMSP)

. TMSP

[45].
Shneiderman [46] — , .
; , ;

4.4

, MHP .
; .
; .
[47,48].
(practice-oriented approaches, POA)
. Shove [49] POA 3 , .
; .
POA [50~55].

4.5

, (cyber-human system, CHS) [56]
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CHS ,
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5

1997 , “ ” “ ” ,
“ ” “ ” , Google AlphaGo
3 “ ” “ ”

[57,58]

5.1

[3]

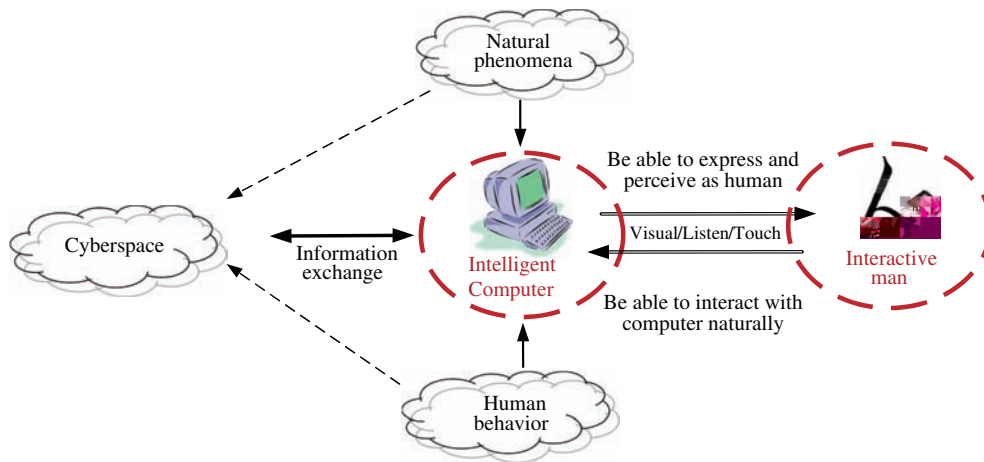
[59]

4

5.2

[60]

(HCI), (human-centered computing, HCC), (CHS). 1960, Licklider^[2] “ ”



4 () “ ” “ ”
 Fig e 4 (Color online) Relationship between \interactive man" with \intelligent computer"

“turn to the wild”.

5.3

Lighthill [62]

1 ; 20 80

[61].

[63].

WIMP

(GUI)

Michael Jordan

Apple

Siri Microsoft Google Google Home Amazon Echo ,

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