

I want a list of Psychological methods for making a software product feel like an intuitive tool

Concept	Source
Metaphoric Interface Design building a metaphor into the interface that would cause the user to evoke a specific mental model in their mind. Once this model is evoked, and the system is designed to be consistent with the behavior of the model, the understanding of the system becomes automatic or intuitive.	"The concept of intuitive metaphor mental model interface design proposes building into the interface some metaphor that would cause the user to evoke a "specific" metaphor mental model in his or her head." "This study draws from research in both metaphoric interface design and mental model." S. Misra & Hilary Chidzoe Okoye 1998
Rough Sets (RS) a method effective in identifying interactions among design attributes	"The RS method is effective in identifying interactions among design attributes." "Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." Ebru Ayas 2011
Graphical Feedback feedback that is presented visually rather than in text form	"This paper will argue the need for extending the concept to encompass the provision of archival feedback - information about past activity." "We also argue the need for graphical, rather than textual, feedback and provide a list of desirable feedback features which should be provided by an application. The paper ends off by examining the means for this provision." K. Renaud & R. Cooper 2000
Video Data Analysis analyzing video data using Noldus Observer VideoPro to gain insights into user interactions and identify intuitive or non-intuitive features	"The video data were later analysed using Noldus Observer VideoPro and compared with answers to the interview questions." "Users were observed and video recorded doing set tasks with the remote." A. Blackler 2003
Integrated Structured Manual a proposed method for making a software product feel like an intuitive tool. By integrating the quick reference facility, command-line database, and facility for full explanation and instruction into a structured manual, users can have a more effective support system that caters to their needs and makes the software feel more intuitive.	"Finally, we suggest a way of combining these facilities into an integrated structured manual, offering more effective user support than is currently provided." "We outline three specific proposals for fulfilling these needs: a quick reference facility, a command-line database, and a facility for full explanation and instruction, and suggest a number of ways in which users might access these facilities." C. O'Malley 1983
Sentiment Analysis The method employs sentiment analysis to determine the affect associated with interactions. This could provide insights into users' emotional responses to the software product, which can be used to make the product more intuitive.	"This paper contributes to the research in this area by proposing a systematic analytical method for assessing the affective aspect of intuitive use; the method uses an ontology of image schemas, computational semantics, and a sentiment analysis to determine the affect associated with interactions." "Until recently, however, there has been little research on the affective aspects of intuitive use." O. K. Asikhia & R. Setchi 2018
Archival Feedback information about past activity that helps users understand their previous interactions with the software	"This paper will argue the need for extending the concept to encompass the provision of archival feedback - information about past activity." "Feedback is traditionally considered to be a communication of immediate system state to the end-user." K. Renaud & R. Cooper 2000
Unexplainable perception that a novel situation is contextually familiar the requirement for intuitive software design to make new situations feel contextually familiar to the user, enhancing the intuitiveness of the software	"Current intuition research outlines three requirements for intuitive use: (a) existing experiential domain knowledge and skills, (b) an unexplainable perception that a novel situation is contextually familiar, and (c) successful application of users' previously acquired experiential knowledge and skills." "This paper reviews intuitive software design and outlines the development of an instrument for analysts to evaluate the intuitiveness of software design." Pat Lehane 2019
Positive Mutual Affect a positive mutual affect among group members led to increased product acceptance	"The results showed that a positive mutual affect among group members led to increased product acceptance, even after controlling for other pragmatic variables such as opinion convergence and communication effectiveness." "We examined subjective metrics of usability and product acceptance with respect to other psychological variables such as personality, background knowledge and group-coherence." T. Yamuchi 2012
Confident Interactions a factor of intuitive use that refers to the software's ability to foster confident interactions with the user, enhancing the intuitiveness of the software	"This paper reviews intuitive software design and outlines the development of an instrument for analysts to evaluate the intuitiveness of software design." "Subsequent factor analysis exposed three factors describing intuitive use: (a) Familiar User Expectations, (b) Confident Interactions, and (c) Leverage of Prior Learning." Pat Lehane 2019
Transparency in Intelligent Systems Transparency can help users form a model of the underlying algorithm's operation. However, positive accuracy perceptions may be undermined when transparency reveals algorithmic errors. Users are both more likely to consult transparency information and to experience greater system insights when formulating a model of system operation.	"On the one hand, transparency can help users form a model of the underlying algorithm's operation." "We use these findings to motivate new progressive disclosure principles for transparency in intelligent systems and discuss theoretical implications." Aaron Springer & S. Whittaker 2020
Context-Dependent Transparency The benefits of transparency are context dependent, helping users form a model of the underlying algorithm's operation but potentially undermining positive accuracy perceptions when it reveals algorithmic errors.	"On the other hand, positive accuracy perceptions may be undermined when transparency reveals algorithmic errors." "Study 2 offers an explanation for this paradox by showing that the benefits of transparency are context dependent." Aaron Springer & S. Whittaker 2020
Familiar User Expectations a factor of intuitive use that refers to the software's ability to meet the user's familiar expectations, making the software feel intuitive	"Subsequent factor analysis exposed three factors describing intuitive use: (a) Familiar User Expectations, (b) Confident Interactions, and (c) Leverage of Prior Learning." "This paper reviews intuitive software design and outlines the development of an instrument for analysts to evaluate the intuitiveness of software design." Pat Lehane 2019
Correspondence Analysis a statistical method used for data analyses in the design process	Ebru Ayas 2011
Feedback and Response Time Provide immediate feedback to user actions. This helps users understand the effect of their actions, making the software feel more responsive and intuitive.	Language model
Consistency of Metaphors with Expected System Behavior Consistency or Metaphors with Expected System Behavior using metaphors that align with how the system is expected to behave, enhancing the user's intuitive understanding of the system.	"Once this model is evoked, and the system is designed to be consistent with the behavior of the model, the understanding of the system becomes automatic or intuitive." "This research addresses the issue of Intuitive Graphical User Interface Design." S. Misra & Hilary Chidzoe Okoye 1998
Facility for Full Explanation and Instruction a proposed method for making a software product feel like an intuitive tool. It provides users with comprehensive explanations and instructions on how to use the system, which can help users understand the system's functionality and how to use it effectively.	"We outline three specific proposals for fulfilling these needs: a quick reference facility, a command-line database, and a facility for full explanation and instruction, and suggest a number of ways in which users might access these facilities." "This paper outlines a set of proposals for the development of system documentation based on an analysis of user needs." C. O'Malley 1983
Quick Reference Facility a proposed method for making a software product feel like an intuitive tool. It provides users with immediate access to the most essential information, allowing them to quickly understand and use the system without having to sift through extensive documentation.	"We outline three specific proposals for fulfilling these needs: a quick reference facility, a command-line database, and a facility for full explanation and instruction, and suggest a number of ways in which users might access these facilities." "This paper outlines a set of proposals for the development of system documentation based on an analysis of user needs." C. O'Malley 1983
Transfer of Intuitive Knowledge using design to help users transfer the intuitive knowledge gained from familiar products onto new products.	"The implications of these new results will be discussed, as will the question of how it may be possible to use design to help users transfer the intuitive knowledge gained from familiar products onto new products." "These results are being used to re-design the universal remote control in order to make it more intuitive." A. Blackler 2003
Representation of Action in AI Planning Systems a well-understood representation of action used in artificial intelligence planning systems	"The theory is based on a well-understood representation of action used in artificial intelligence planning systems." "Nevertheless the tractability of the user interface, in contrast to the physical world, allows us to develop a limited theory of interface affordances." R. Amant 1998
Partial Least Squares (PLS) a statistical method used for data analyses when the number of product attributes is large in comparison to the number of observations	"Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." "RS results are consistent with PLS attribute predictions." Ebru Ayas 2011
Leverage of Prior Learning a factor of intuitive use that refers to the software's ability to leverage the user's prior learning, making the software feel intuitive	"Subsequent factor analysis exposed three factors describing intuitive use: (a) Familiar User Expectations, (b) Confident Interactions, and (c) Leverage of Prior Learning." "This paper reviews intuitive software design and outlines the development of an instrument for analysts to evaluate the intuitiveness of software design." Pat Lehane 2019
Appearance Affecting Intuitive Use Appearance (shape, size and labelling of features) seems to be the variable that most affects time on task and intuitive uses. Using familiar labels and icons and possibly positions for buttons helps people to use a product quickly and intuitively the first time they encounter it.	"Appearance (shape, size and labelling of features) seems to be the variable that most affects time on task and intuitive uses." "This position has been supported by experimental studies." A. Blackler 2005
Transfer of Past Experience Relevant past experience is transferable between products and contexts, affecting performance and making the product feel intuitive.	"The findings suggest that relevant past experience is transferable between products, and probably also between contexts, and performance is affected by a person's level of familiarity with similar technologies." "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." Cover Sheet 2006
Computational Semantics The method also uses computational semantics to determine the affect associated with interactions. This could help in understanding how users perceive and interact with the software product.	"The findings suggest that relevant past experience is transferable between products, and probably also between contexts, and performance is affected by a person's level of familiarity with similar technologies." "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." A. Blackler 2006
Use of Image Schemas The method proposed in the paper uses an ontology of image schemas to assess the affective aspect of intuitive use. These schemas are linked to the affective experiences of the users, allowing experiences to be directly linked to the specific image schemas employed in the design.	"The study has the potential to lead to improvements in design and the improved evaluation of intuitive use because it allows experiences to be linked directly to the specific image schemas employed in the design." "This paper contributes to the research in this area by proposing a systematic analytical method for assessing the affective aspect of intuitive use; the method uses an ontology of image schemas, computational semantics, and a sentiment analysis to determine the affect associated with interactions." "Until recently, however, there has been little research on the affective aspects of intuitive use." O. K. Asikhia & R. Setchi 2018
Consistency in Function, Location, and Appearance ensuring consistency of features between different parts of the design and throughout each part, allowing users to apply the same knowledge and metaphors across all parts of the interface.	"Appearance (shape, size and labelling of features) seems to be the variable that most affects time on task and intuitive uses." "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." A. Blackler 2005
Harmonica Engagement establishing the best harmonica engagement between human user and software application, based on cognitive analysis	"This paper represents the progress report on the development relative to the state of art needed to have multidisciplinary technologies for establishing the best harmonica engagement between human user and software application, based on cognitive analysis." "This paper reports on our experience in adapting emotional experiences of the software engineers in the evolutionary design of software systems." Haruhi Fujita 2009
Semantic minima and the interpretation of dorian attributes	"The dorian knowledge can be derived from this method. Like the semantic minima and the interpretation of dorian attributes, makes it possible to benefit

Semantics Mapping and the Interpretation of Design Knowledge	the design knowledge gained from this method makes it possible to benefit the activity of the designers as a creativity support tool	THE DESIGN KNOWLEDGE YOU DERIVED FROM THIS METHOD, AND THE SEMANTIC MAPPINGS AND THE INTERPRETATION OF DESIGN KNOWLEDGE, MAKES IT POSSIBLE TO BENEFIT THE ACTIVITY OF THE DESIGNERS AS A CREATIVITY SUPPORT TOOL." "This very innovative emotion assessment method incorporates the modality of sound, thus complementing research in the field which so far focused on the modality of sight." Weihua Lu & Jean-François Petiot 2014
Progressive Disclosure	A design technique that initially simplifies feedback to reduce cognitive load and gradually reveals more information as needed.	"Results confirmed Study 2, in showing that users are both more likely to consult transparency information and to experience greater system insights when formulating a model of system operation.", "Results again suggest that users may benefit from initially simplified feedback that hides potential system errors and assists users in building working heuristics about system operation." Aaron Springer & S. Whittaker 2020
Help Users Recognize, Diagnose, and Recover from Errors	Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.	<i>Language model</i> ⓘ
3D workload simulations	a method used for ergonomic product evaluations	"For ergonomic product evaluations, direct observations, 3D workload simulations, time and frequency analyses were conducted.", "Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." Ebru Ayas 2011
Cognitive Mapping	Design your software to match the user's mental model of how it should work. This can be achieved through user research and usability testing.	<i>Language model</i> ⓘ
Inclusion of Familiar Features and Controls	including familiar features and controls in a product, consistent with the user's past experience, to increase intuitive usability	"Including familiar features and controls in a product, in a way that is consistent with the user's past experience, should increase the intuitive usability of that product.", "The implications of these new results will be discussed, as will the question of how it may be possible to use design to help users transfer the intuitive knowledge gained from familiar products onto new products." A. Blackler 2003
Recognition Over Recall	Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another.	<i>Language model</i> ⓘ
Sensemaking Process	dynamic processes of data selection and frame/schema revision. Relevant data are selected according to one's frame (prior knowledge/beliefs/mindsets), the data are interpreted and the frame is revised according to the interpretation. Sensemaking goes through cycles of this data selection/interpretation and frame/schema revision loop.	"Sensemaking consists of dynamic processes of data selection and frame/schema revision.", "User Experience as a Sensemaking Process Klein et al. (2006) and Pirolli and Card (2005) provide models of sensemaking." T. Yamauchi 2012
Transparency	Users are more likely to consult transparency information and to experience greater system insights when formulating a model of system operation.	"Results confirmed Study 2, in showing that users are both more likely to consult transparency information and to experience greater system insights when formulating a model of system operation.", "Study 3 explored real-time reactions to transparency." Aaron Springer & S. Whittaker 2020
Successful application of users' previously acquired experiential knowledge and skills	the requirement for intuitive software design to allow users to successfully apply their previously acquired knowledge and skills, making the software feel intuitive	"Current intuition research outlines three requirements for intuitive use: (a) existing experiential domain knowledge and skills, (b) an unexplainable perception that a novel situation is contextually familiar, and (c) successful application of users' previously acquired experiential knowledge and skills.", "These factors map one-on-one to the requirements for intuitive use: providing an early confirmation of the proposed structure for analysis of intuitive software design and use." Pat Lehane 2019
Familiarity Principle	Using existing features, labels, icons, and metaphors to make a new product or function more intuitive and understandable to users.	"Principle two requires the use of metaphor to make something completely new familiar by relating it to something already existing.", "Principle two; make it obvious what less well-known functions will do by using familiar things as metaphors to demonstrate their function." A. Blackler 2003
Automated Configuration	A software framework that automates configuration processes for software visualization, simplifying access and making it more intuitive for users.	"With a focus on tasks engineers commonly use during their daily maintenance work, we implemented a framework to automate the configuration processes for a software visualization. We combined the approaches with tactile navigation on multitouch devices.", "The main advantages of our methodology are found in particular in:" Sandro Bocuzzo 2012
Design Principles	Proximity, Similarity, and Symmetry principles used in interface design to make the software product feel more intuitive.	"And the symmetry principle is related to the attempt to simplify the figure to make it conform to the human visual habits.", "Conclusion The proximity principle and the similarity principle are related to the tendency of trying to group the objects." Yanxia Liang 2018
User Observation and Feedback	observing and interviewing users to improve the intuitive usability of a software product.	"Users were observed and video recorded doing set tasks with the remote.", "A new set of experiments was conducted using a largely software-based universal remote control." A. Blackler 2003
Prior knowledge of features or functions	In a previous study, these authors found through experimentation that prior knowledge of features or functions of a digital camera allowed participants to use those features intuitively, whereas unfamiliar features or functions had to be worked out, which was more time consuming and effortful.	"In a previous study, these authors found through experimentation that prior knowledge of features or functions of a digital camera allowed participants to use those features intuitively, whereas unfamiliar features or functions had to be worked out, which was more time consuming and effortful.", "This paper will explore the application of "intuitive use" to design." A. Blackler 2003
Cognitive Perception of Virtual Entities	The software uses familiar natural objects to represent virtual entities, making it easier for users to understand and interact with the software.	"Cognitive perception of virtual entities.", "With our approach we can match virtual entities to familiar natural objects." Sandro Bocuzzo 2012
Consistency in User Interface Design	designing software to be consistent in behavior, interface, and interaction techniques to reduce cognitive load and improve user experience.	"Conceptual consistency is defined in terms of the internal coherence of a system's structure and the nature of the mapping from user task goals to system procedures.", "This paper argues that interface consistency must also be addressed at a conceptual level." Wendy A. Kellogg 1987
Immediate System State Communication	communication of the immediate system state to the end-user	"Feedback is traditionally considered to be a communication of immediate system state to the end-user.", "However, the nature of the feedback and the manner of this provision is by no means agreed upon." K. Renaud & R. Cooper 2000
Tactile Navigation	The software uses multitouch devices to allow natural and intuitive interaction with the software.	"With a focus on tasks engineers commonly use during their daily maintenance work, we implemented a framework to automate the configuration processes for a software visualization. We combined the approaches with tactile navigation on multitouch devices.", "This offered an observer access to explore a software with more natural behavior, similar as moving objects such as a glass or a paper around a table.?" a general research question, we stated the thesis: Visualizing evolving source code in a comprehensive understandable form provides insights to existing and emerging problems and supports relevant aspects with adequate tactile interaction and aural feedback. In the end, we opened the horizon to possibilities of improving multitouch navigation with simple spoken commands and looked at the opportunities that our approach offers for the collaboration among software engineers involved in the team." Sandro Bocuzzo 2012
Affordance Theory	a theory of properties of the relationship between an agent (user) and its environment (software interface) that allow and facilitate specific types of interaction, including procedures to develop and evaluate affordances in the interface.	"This article describes the theory, shows how existing interface mechanisms fit into its conceptual framework, identifies novel interface affordances suggested by the framework, and outlines procedures to develop and evaluate affordances in the interface.", "Unfortunately, there exists no general theory of physical affordances to give us guidance in building appropriate affordances into software." R. Amant 1998
Guided Analysis of Data	The software uses audio signals on top of visualizations to help users analyze data without losing focus on the primary software visualization.	"Guided analysis of data.", "When using audio on top of a visualization an observer can address the audio signal to support its visual impression and preserve its focus on the primer software visualization." Sandro Bocuzzo 2012
Multiple Regression	a statistical method used for data analyses in the design process	"Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses.", "From a methodological viewpoint, Likert scales, free elicitation technique and Just About Right scales were applied for data collection." Ebru Ayas 2011
Positioning of buttons	positioning buttons in familiar places can help users use the product quickly and intuitively the first time they encounter it	"Using familiar labels and icons and possibly positions for buttons helps people to use a product quickly and intuitively the first time they encounter it.", "This position has been supported by experimental studies." A. Blackler 2006
Continuity Principle	This principle is also related to the tendency to try to give the object a complete form. It can be used in interface design to make the software product feel more intuitive by ensuring a smooth flow of information and operations.	"The closed principle and the continuity principle are related to the tendency to try to give the object a complete form.", "Conclusion The proximity principle and the similarity principle are related to the tendency of trying to group the objects." Yanxia Liang 2018
Principles and Conceptual Tool for Intuitive Design	A set of principles and a conceptual tool have been developed to assist designers in producing interfaces that are intuitive to use.	"A set of principles and a conceptual tool have been developed based on the experimental work, with the aim of assisting designers in producing interfaces that are intuitive to use.", "The principles and tool are explained and an initial trial of the tool is also described and the findings discussed." Cover Sheet 2006
Consistency with Past Experience	Including familiar features and controls in a product, in a way that is consistent with the user's past experience, should increase the intuitive usability of that product.	"A new set of experiments was conducted using a largely software-based universal remote control.", "Users were observed and video recorded doing set tasks with the remote." A. Blackler 2003
Command-line Database	another proposed method for making a software product feel like an intuitive tool. It provides users with a database of commands that they can use to interact with the system, potentially making the software more accessible and easier to use.	"This paper outlines a set of proposals for the development of system documentation based on an analysis of user needs.", "We outline three specific proposals for fulfilling these needs: a quick reference facility, a command-line database, and a facility for full explanation and instruction, and suggest a number of ways in which users might access these facilities." C. O'Malley 1983
Flexibility and Efficiency of Use	Accelerators, unseen by the novice user, may often speed up the interaction for the expert user to such an extent that the system can cater to both inexperienced and experienced users.	<i>Language model</i> ⓘ
Analysis of Variance models	employed to examine how various shape factors influence users' emotional responses	"Analysis of Variance models are employed to examine how various shape factors influence users' emotional responses.", "The method is described on an application case, an eyeglass frame." Weihua Lu & Jean-François Petiot 2014
Closure Principle	This principle is related to the tendency to try to give the object a complete form. It can be used in interface design to make the software product feel more intuitive by providing a sense of completeness.	"Conclusion The proximity principle and the similarity principle are related to the tendency of trying to group the objects.", "The closed principle and the continuity principle are related to the tendency to try to give the object a complete form." Yanxia Liang 2018
Auditory Parameter Method	a non-verbal technique that uses auditory stimuli (music samples) and association tests for evaluating a set of products, given by their pictures. It provides an assessment of these products according to a series of emotional dimensions.	"Analysis of Variance models are employed to examine how various shape factors influence users' emotional responses.", "The method is described on an application case, an eyeglass frame." Weihua Lu & Jean-François Petiot 2014
Simple Spoken Commands	The software can be navigated using simple spoken commands, making it more intuitive and easy to use.	"The main advantages of our methodology are found in particular in:", "Multi-Touch screen technology combined with an audio supported 3D software visualization offers a promising way for the software engineers involved in a project to understand a software system and share knowledge about it in an intuitive manner." Sandro Bocuzzo 2012
Importance of Appearance	The appearance of a product, including its shape, size, and labeling of features, significantly affects its intuitive use.	"Appearance (shape, size and labelling of features) seems to be the variable that most affects intuitive uses.", "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." Cover Sheet 2006

		"Appearance (shape, size and labelling of features) seems to be the variable that most affects intuitive uses.", "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." A. Blackler 2006
Just About Right scales a psychological method used for data collection in the design process		"From a methodological viewpoint, Likert scales, free elicitation technique and Just About Right scales were applied for data collection.", "Several methods from psychology, ergonomics, statistics and probabilistic methods and heuristics were applied to achieve the objectives." Ebru Ayas 2011
Intuitive Design Utilizing familiar symbols, labels, icons, and metaphors to make a software product more intuitive and easier to use.		"Our general approach is to use objects known from our daily life such as the simple shape of a house to represent software components.", "Because human observers know from their daily life how the glyph should look like, they recognize well-formed proportions of houses, e.g. roof versus body of the house." Sandro Bocuzzo 2012
		"Using familiar labels and icons and possibly positions for buttons helps people to use a product quickly and intuitively the first time they encounter it.", "Appearance (shape, size and labelling of features) seems to be the variable that most affects intuitive uses." Cover Sheet 2006
		"Using familiar labels and icons and possibly positions for buttons helps people to use a product quickly and intuitively the first time they encounter it.", "Appearance (shape, size and labelling of features) seems to be the variable that most affects intuitive uses." A. Blackler 2006
		"Three principles have been developed to help designers develop interfaces which are intuitive to use.", "Intuitive interaction involves utilising knowledge gained through other products or experience(s)." A. Blackler 2005
		"This research addresses the issue of Intuitive Graphical User Interface Design.", "This study draws from research in both metaphoric interface design and mental model." S. Misra & Hillary Chidzoye Okoye 1998
Facial and Voice Analysis using both facial and voice analysis to measure and observe user behavior, and enhance engagement.		"We approach the user best engagement from facial and voice analysis.", "And through it, we can measure (collectivized and quantified), and observe the user behavior, and accordingly enhance the engagement by generative interactive scenario." H. Fujita 2007
		"And through it, we have measured (collectivized and quantified) and observed the user behavior, and accordingly enhanced the engagement by generative interactive scenario.", "The best performance related engagement has been achieved using together both the facial and voice analysis." Hamido Fujita 2009
Factor Analysis a statistical method used for data analyses in the design process		"From a methodological viewpoint, Likert scales, free elicitation technique and Just About Right scales were applied for data collection.", "Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." Ebru Ayas 2011
Audio Support The software uses audio feedback to enhance the user experience by providing additional information about visualized software components.		"In our work, we used an aural feedback to get a fast glimpse on other secondary characteristics of a visualized software component and researched how the use of audio feedback combined with sound technologies allow to guide an observer towards interesting aspects in a visualization. On top of this audio-visual approach, we looked for a simplification to access software visualization in general.", "However, most software visualizations focus on improving the perception of a software system." Sandro Bocuzzo 2012
Integration of emotional qualities in the design of products a methodology that takes into account the cognitive and affective processing of users. It incorporates the modality of sound, complementing research in the field which so far focused on the modality of sight.		"This very innovative emotion assessment method incorporates the modality of sound, thus complementing research in the field which so far focused on the modality of sight.", "Relevance to industry This study presents a methodology to the integration of emotional qualities in the design of products, which taking into account the cognitive and affective processing of users." Weihua Lu & Jean-François Petiot 2014
Intuitive Collaboration The software uses a multi-touch environment to provide intuitive controls and leverage multiuser capabilities, facilitating information sharing and collaboration.		"Intuitive collaboration.", "In a multi-touch environment we can arrange the access to adequate controls in an intuitive and natural way and leverage the multiuser capabilities of tactile devices together with information sharing approaches." Sandro Bocuzzo 2012
Predictability another system criterion that can be used to reduce the possibility of human error in system use. Like visibility, it is a property of interactive systems that can be expressed in an interaction model of a computer system.		"These criteria are classes of interactive systems properties that may be expressed in terms of an interaction model of a computer system.", "We summarise a psychological explanation of human error, and show that system criteria such as visibility and predictability can be used to reduce the possibility of human error in system use." Michael Harrison 1991
Heuristic methods found effective when there is a high number of product attributes that interact to provide quality feelings		"Heuristic methods were found effective when there is a high number of product attributes that interact to provide quality feelings.", "Five product applications are included in this thesis: operator driver cabin design of reach trucks, steering wheel design trigger switch design in right-angled nutrunners, bed-making systemsproducts and waiting room environments." Ebru Ayas 2011
Gestalt Principles Use principles of visual perception to make your software more intuitive. For example, group related elements together and use visual hierarchy to guide the user's attention.		Language model ⓘ
Appearance of the product designing the shape, size, and labeling of features in a way that most affects intuitive uses		"Appearance (shape, size and labelling of features) seems to be the variable that most affects intuitive uses.", "This position has been supported by experimental studies." A. Blackler 2006
Development of Principles and Tools A set of principles and a conceptual tool have been developed with the aim of assisting designers in producing interfaces that are intuitive to use.		"A set of principles and a conceptual tool have been developed based on the experimental work, with the aim of assisting designers in producing interfaces that are intuitive to use.", "Using familiar labels and icons and possibly positions for buttons helps people to use a product quickly and intuitively the first time they encounter it." A. Blackler 2006
Visibility a system criterion that can be used to reduce the possibility of human error in system use. It is a property of interactive systems that can be expressed in an interaction model of a computer system.		"These criteria are classes of interactive systems properties that may be expressed in terms of an interaction model of a computer system.", "We summarise a psychological explanation of human error, and show that system criteria such as visibility and predictability can be used to reduce the possibility of human error in system use." Michael Harrison 1991
Generative Interactive Scenario enhancing user engagement through interactive scenarios that respond to the user's behavior using facial and voice analysis.		"And through it, we can measure (collectivized and quantified), and observe the user behavior, and accordingly enhance the engagement by generative interactive scenario.", "We approach the user best engagement from facial and voice analysis." H. Fujita 2007
Use of Experiential Knowledge The design process should incorporate familiar features to allow users to intuitively understand and use the new product.		"And through it, we have measured (collectivized and quantified) and observed the user behavior, and accordingly enhanced the engagement by generative interactive scenario.", "This paper reports on our experience in adapting emotional experiences of the software engineers in the evolutionary design of software systems." Hamido Fujita 2009
Multiuser Capabilities The software leverages the multiuser capabilities of tactile devices, allowing for intuitive collaboration and information sharing among users.		"Current intuition research outlines three requirements for intuitive use: (a) existing experiential domain knowledge and skills, (b) an unexplainable perception that a novel situation is contextually familiar, and (c) successful application of users' previously acquired experiential knowledge and skills.", "This paper reviews intuitive software design and outlines the development of an instrument for analysts to evaluate the intuitiveness of software design." Pat Lehane 2010
Semantic Differential using Principal Component Analysis and Generalized Procrustes Analysis compared with the proposed method to demonstrate the effectiveness of the protocol. It helps in collecting the intuitive emotions of users and providing a discriminant measurement of emotions.		"A literature review has revealed that intuition is based on experiential knowledge.", "Therefore, people can only use intuitive processing if they have had previous experience to draw on, and so the things that humans use intuitively are those that employ features which they have encountered before." A. Blackler 2003
User Control and Freedom Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue.		"And through it, we can measure (collectivized and quantified), and observe the user behavior, and accordingly enhance the engagement by generative interactive scenario.", "We approach the user best engagement from facial and voice analysis." H. Fujita 2007
Utilizing Knowledge from Other Products Designing intuitive software products by utilizing knowledge gained from other products or experiences.		"Intuitive interaction involves utilising knowledge gained through other products or experience(s).", "Therefore, products that people use intuitively are those with features they have encountered before." Cover Sheet 2006
Emotional Needs Satisfaction The software design should meet people's emotional needs, providing an enjoyable experience and good feelings when interacting with the computer.		"Intuitive interaction involves utilising knowledge gained through other products or experience(s).", "The findings suggest that relevant past experience is transferable between products, and probably also between contexts, and performance is affected by a person's level of familiarity with similar technologies." A. Blackler 2006
Help and Documentation Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.		Language model ⓘ
Error Prevention Design your software to prevent errors from happening in the first place. This can be achieved through good design practices like form validation, clear instructions, and undo functions.		Language model ⓘ
Cognitive Process Consideration The design of the software interface should consider the user's cognitive process, which includes perception, attention, memory, thinking, association, and emotional experience. The primary cognitive stage lays the foundation for the advanced stage of emotional experience.		"Primary cognitive stage lay foundation for the advanced stage of emotional experience.", "The people's cognitive process includes: perception, attention, memory, thinking, associate, emotional experience." Peng Shi 2011
Aesthetic and Minimalist Design Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.		Language model ⓘ
Consistency and Standards Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.		Language model ⓘ

Likert scales a psychological method used for data collection in the design process	"From a methodological viewpoint, Likert scales, free elicitation technique and Just About Right scales were applied for data collection.", "Several methods from psychology, ergonomics, statistics and probabilistic methods and heuristics were applied to achieve the objectives." Ebru Ayas 2011
Genetic algorithms a heuristic method used for data analyses in the design process	"Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses.", "From a methodological viewpoint,Likert scales, free elicitation technique and Just About Right scales were applied for data collection." Ebru Ayas 2011
Perfect Interaction Relationship The software should not only function as a tool but also act as an emotional partner, creating a perfect interaction relationship between the software and the user.	"The perfect interaction relationship between software and human make the software not only become a tool, but also like emotional partner. interface is an interactive media between man and computer, the learning, understanding, mastering of software is experienced a cognitive process from shallow into a deep.", "People dislike the interface of software is lifeless and frosty in every day use, people have emotional needs, and software design also needs to meet people's spiritual needs.in software world, the need of user is not only function of software, more important is enjoyable experience and good feelings when interactive with computer." Peng Shi 2011
Direct observations a method used for ergonomic product evaluations	"For ergonomic product evaluations, direct observations, 3D workload simulations, time and frequency analyses were conducted.", "Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." Ebru Ayas 2011
Human Cognitive Analysis The software application is designed based on human cognitive analysis to establish the best harmony engagement between the human user and the software.	"The works here reported present development progress report in relation to the state-of art that need to create the multidisciplinary technologies, needed to establish best harmony engagement between human user the software application, based on human cognitive analysis.", "The paper reports on our experience to in adapting emotional experiences of the software engineers in evolutionary design of software systems." H. Fujita 2007
Time and frequency analyses a method used for ergonomic product evaluations	"For ergonomic product evaluations, direct observations, 3D workload simulations, time and frequency analyses were conducted.", "Multiple Regression, Factor Analysis, Correspondence Analysis, Genetic algorithms, Partial Least Squares (PLS) and Rough Sets (RS) were applied for data analyses." Ebru Ayas 2011
User Experience Focus The human-machine interface should be designed in a way that provides users with a perfect experience, satisfying their emotional demands.	"How to design the human-machine interface to make users reaches perfect experience, satisfying the customer emotional demands?", "Primary cognitive stage lay foundation for the advanced stage of emotional experience." Peng Shi 2011