Questions out of StudOn course.

In the exam only one question was totally new and not the same or a inverted question out of these question out of the exercise class.

SELF TEST 1

Fill the gaps to complete the given statement about anthropomorphism:

- Attributing human-like qualities oder human like qualities to inanimate objects
- Well known phenomenon in advertisement
- Much exploited in human-computer interaction oder human computer interaction oder human-computer-interaction oder HCI
- Reeves and Naas (1996) found that computers that flatter and praise users in education software programs have a positive impact on them.

Name the three factors that influence the User Experience (UX).

- Product Design
- Context of Use
- Users' Skills an Expectations

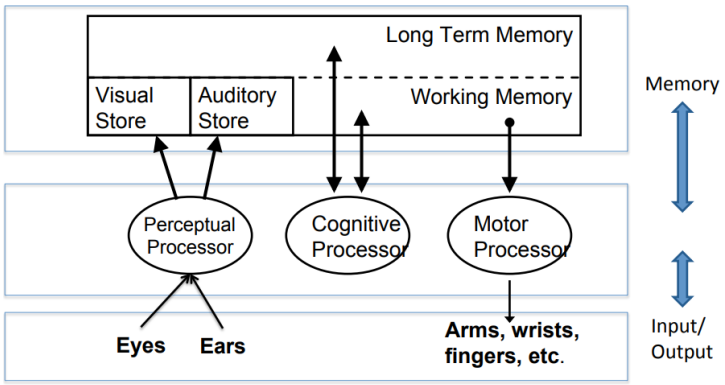
Name the two factors that affect forgetting and choose the respective description.

- Decay - Information is lost gradually but very slowly
- Interference - New information replaces old, or old information may interfere with new

Inventions of HCI History

- Vannevar Bush: MEMEX
- Ivan Sutherland: SketchPad
- Douglas Engelbart: Mouse

Complete the Model Human Processor by choosing the missing terms for the respective gaps.



Assign the correct descriptions to the five quality components of Usability.

- How easy is it for users to accomplish basic tasks the first time they encounter the design?
  passt zu Learnability
- Once users have learned the design, how quickly can they perform tasks?
  passt zu Efficiency
- When users return to the design after a period of not using it, how easily can they reestablish proficiency?
  passt zu Memorability
- How many errors do users make, how severe are these errors, and how easily can they recover from the errors?
  passt zu Errors
- How pleasant is it to use the design?
  passt zu Satisfaction

Recall, Recognition

- Recall: Information reproduced from memory can be assisted by cues, e.g. categories, imagery
- Recognition: Information gives knowledge that it has been seen before

Task-Artifact Cycle:

Choose the missing words to complete **Jakob Nielsen's definition of Usability**.

Usability is a quality attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process.

Assign the correct descriptions to the terms **Utility**, **Usability**, and **Likeability**.

- Can a product be used to reach a certain goal or to perform a certain task?

passt zu **Utility**

- How well does a product support the user to reach a certain goal or to perform a certain task? Relates to the question of quality and efficiency.

passt zu **Usability**

- Do people like the product? This may be related to utility and usability but not necessarily.

passt zu **Likeability**

What causes spatial hearing:

- ITD (Interaural time difference)
- IID (Interaural intensity difference)
- HRTF (Head related transfer function

Assign the correct descriptions to each Gestalt law:

Law of Similarity	passt zu	Items that are similar tend to be grouped together
Law of Proximity	passt zu	Objects near each other tend to be grouped together
Law of Continuity	passt zu	Lines are seen as following the smoothest path
Law of Closure	passt zu	Objects grouped together are seen as a whole
Law of Pragnanz (Law of Simplicity / Law of good shape)	passt zu	Reality is organized or reduced to the simplest form possible
Law of common fate	passt zu	Elements with the same moving directions are perceived as a collective or unit
Law of Symmetry	passt zu	Symmetrical images are perceived collectively, even in spite of distance

Name the four subcomponets of Robustness

- Observability
- Recoverability
- Task conformance
- Responsiveness

Name the eight Golden Rules

1. Strive for consistency
2. Enable frequent users to use shortcuts
3. Offer informative feedback
4. Design dialogues to yield closure
5. Error prevention/handling
6. Permit easy reversal of actions
7. Support internal locus of control
8. Reduce short-term memory load

Complete the definition of Affordance by entering the missing terms at the respective gaps.

- Affordance is the **perceived possibility** for action
- Objective properties that **imply action possibilities** - how we can use things - independent of the individual (Gibson)
- Perceived Affordance includes **experience of an individual** (Norman)

Principles to support Usability (by Dix)

Learnability passt zu The ease with which new users can begin effective interaction and achieve maximal performance
Learnability passt zu Predictability, Synthesizability, Familiarity, Generalizability, Consistency
Flexibility passt zu The multiplicity of ways the user and system exchange information
Flexibility passt zu Dialogue initiative, Multithreading, Task migratability, Substitutivity
Robustness passt zu Observability, Recoverability, Task conformance, Responsiveness
Robustness passt zu The level of support provided to the user in determining successful achievement and assessment of goal-directed behavior

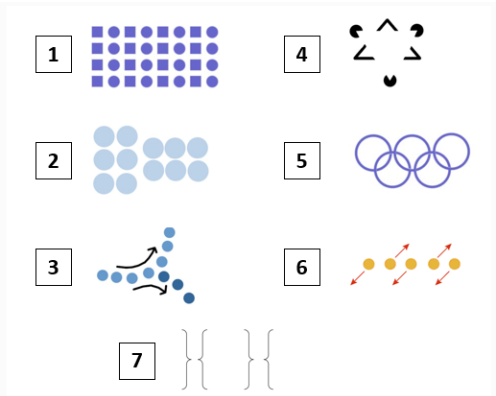
Assign the correct descriptions to the different **types of distances.**
Intimate distance: up to 0.5 meters , comforting, threatening
Personal distance: 0.5 - 1.25 meters , conversation between friends
Social distance: 1.25 - 3.5 meters , impersonal business dealings
Public distance: more than 3.5 meters , addressing a crowd

Name the important factors for interpreting a visual signal.

- Size and depth
- Brightness
- Color

Assign the correct descriptions to Perception and Cognition which are the two components of visual information processing.
Perception passt zu Sensors and signal processing in the eye and brain
Cognition passt zu "Understanding" in the brain

Gestalt laws:



1. Law of Similarity oder Similarity
2. Law of Proximity oder Proximity
3. Law of Continuity oder Continuity
4. Law of Closure oder Closure
5. Law of Pragnanz oder Pragnanz oder Law of Simplicity oder Simplicity oder Law of good shape oder Good shape
6. Law of common fate oder Common fate
7. Law of Symmetry oder Symmetry

Name the three principles to support Usability proposed by Alan Dix et al.

1. Learnability
2. Flexibility
3. Robustness

Name the two parts of visual information processing.

1. Perception
2. Cognition

Complete the description of Change Blindness by entering the missing terms at the respective gaps.

- Phenomenon in visual perception
- Large changes in a scene are not noticed
- Happens when there is a short distraction , e.g. "mud splashes", "brief flicker", "cover box"

Complete the description of the KLM by filling the gaps with the correct words.

- KLM stands for **Keystroke-Level Model**
- It is a **simplified** version of GOMS
- It uses only operators on keystroke-level oder keystroke level , no sub-goals, no methods, and no selection rules
- KLM predicts how much time it takes to execute a task
- The execution of a task is decomposed into primitive operators, which are
    - Physical motor operators (pressing a button, pointing, drawing a line, ...)
    - Mental operator (preparing for a physical action)
    - System response operator (user waits for the system to do something)

Complete the given statement about Hick's Law by filling the gaps with the missing words.
Hick' Law states that the **time** needed to make a **selection** is **proportional** to the **log** number of alternatives given.

Give the equation describing the Steering Law.
MT = a+b*D/W

Name the four components of the GOMS Model and complete the description by filling the gaps with the correct words.
G: Goals

O: Operators

M: Methods

S: Selection rules

User tasks are split into goals oder split up into goals which are achieved by solving sub-goals oder sub goals in a divide-and-conquer fashion.

Complete the given statement about Fitts's Law by choosing the missing words for the respective gaps.
The time to acquire a target is a function of the distance to and size of the target and depends on the particular pointing system.

Assign the correct descriptions to these two main types of errors users can make.
Slips passt zu Right goal but wrong action, result of “automatic” behaviour, appropriate goal but performance/action is wrong
Mistakes passt zu Wrong goal, overgeneralization, wrong conclusions

Complete the given statement about the Steering Law by filling the gaps with the missing words.
The time to acquire a target through a tunnel is a function of the length and width of the tunnel and depends on the particular pointing system oder pointing system.

Mark the correct statements about the strengths and weaknesses of the GOMS model.

Ausgewählt	Spending time is not modeled
Ausgewählt	No real users
Ausgewählt	Difficult to target specific users
Nicht ausgewählt	Possible to target specific users
Ausgewählt	Various variable paramteres
Nicht ausgewählt	Not enough variable parameters
Ausgewählt	Difficult to model novel interactions
Nicht ausgewählt	Easy to model novel interactions
Ausgewählt	Good treatment of learning effects
Ausgewählt	Good to identify bottlenecks
Nicht ausgewählt	Learning effects are not modeled
Ausgewählt	Low costs regarding time and money investment
Nicht ausgewählt	High costs regarding time and money investment

Fitt's Law equation

$$MT = a + b\ log_2(1 + \frac{D}{W})$$

Assign the correct descriptions to the different types of slips users can make.

Capture errors passt zu Two actions with common start point, the more familiar one captures the unusual (driving to work on Saturday instead of the supermarket)

Description errors passt zu Performing an action that is close to the action that one wanted to perform (putting the cutlery in the bin instead of the sink)

Data driven errors passt zu Using data that is visible in a particular moment instead of the data that is well-known (calling the room number you see instead of the phone number you know by heart)

Associate action errors passt zu You think of something and that influences your action (e.g. saying come in after picking up the phone)

Loss-of-Activation error (forgetting) passt zu In a given environment you decided to do something but when leaving then you forgot what you wanted to do. Going back to the start place you remember

Mode error passt zu You forget that you are in a mode that does not allow a certain action or where a action has a different effect

Arrange the seven phases of Norman's Action Cycle in the correct order.

1. Perceiving the state of the world
2. Interpreting the perception
3. Evaluation of interpretations
4. Goals
5. Intention to act
6. Sequence of actions
7. Execution of the sequence

Assign the correct definitions for type I and type II errors.

Type I error	passt zu	Non existing effect was found (false positive)
Type II error	passt zu	Effect exists but was not found (false negative)

Complete the given statements about the Wizard of Oz.

- Method for testing a non-existing system oder non existing system
- Human "wizard" simulates system responses (interacts with user via a simulated software user interface)
- Useful for adding complex vertical oder complex, vertical oder complex and vertical functionality (speech and gesture recognition, language translation, ...)

Find the correct statements about ANOVA.

Ausgewählt	If more then two means are compared
Nicht ausgewählt	If not more than two means are compared
Ausgewählt	More general than the two sample t-test
Nicht ausgewählt	Less general than the two sample t-test

Name the different kinds of taxonomy of prototypes.

Horizontal	vs.	vertical prototypes
Low-fidelity	vs.	high-fidelity prototypes
Non-functional	vs.	functional prototypes
Evolutionary	vs.	throw-away prototypes

Assign the statements to either high- or low-fidelity prototypes.

Low-fidelity prototypes	passt zu	Fast, cheap, and easy to change
Low-fidelity prototypes	passt zu	Early and active user involvement
Low-fidelity prototypes	passt zu	Examples: sketches, paper prototypes, mock-up screens, ...
Low-fidelity prototypes	passt zu	Check ideas and interaction flow
Low-fidelity prototypes	passt zu	No real functionality, difficult to identify errors
High-fidelity prototypes	passt zu	Looks & feels like the final product to the user
High-fidelity prototypes	passt zu	Functionality is restricted, only certain functions work
High-fidelity prototypes	passt zu	Can be used to predict task efficiency of the product
High-fidelity prototypes	passt zu	Feedback often centered around the look & feel
High-fidelity prototypes	passt zu	May be very time consuming to implement

Complete the statements about internal and external validity.
Internal validity:

- Ensure
    - Defined tasks, manipulations, measures
    - Controlled environment
    - Proper sample
    - Repeatability
- Manipulation is the true cause of the outcomes
- Strong causality between independent and dependent variables
- Able to rule out other causes for your dependent variables
- Unambiguous assignment of causes to effects

External validity:

- Ability to generalize study results to other people and other situations (outside the laboratory)
- Study needs to cover
    - Large sample of a population
    - Number of representative situations
    - All relevant times
    - Various locations

Complete the statements about the SUS by filling the gaps with the missing words.

- SUS stands for System Usability Scale
- The SUS is a 10 item questionnaire with 5 response options
- The SUS yields a single number representing a composite measure of the overall usability of a system
- Scores for individual items are not meaningful on their own
- SUS scores range from 0 to 100 and the average is represented at score 68

Complete the statements about AttrakDiff by filling the gaps with the missing words.

- AttrakDiff is a tool for assessing and evaluation oder assessment and evaluation oder assessing, evaluating oder assessment, evaluation of User Experience
- Evaluating how attractive products and systems are with regard to usability and design
- The questions are pair-wise set of words that represent opposites

Assign the respective descriptions, advantages, and disadvantages to mode, median, and mean.

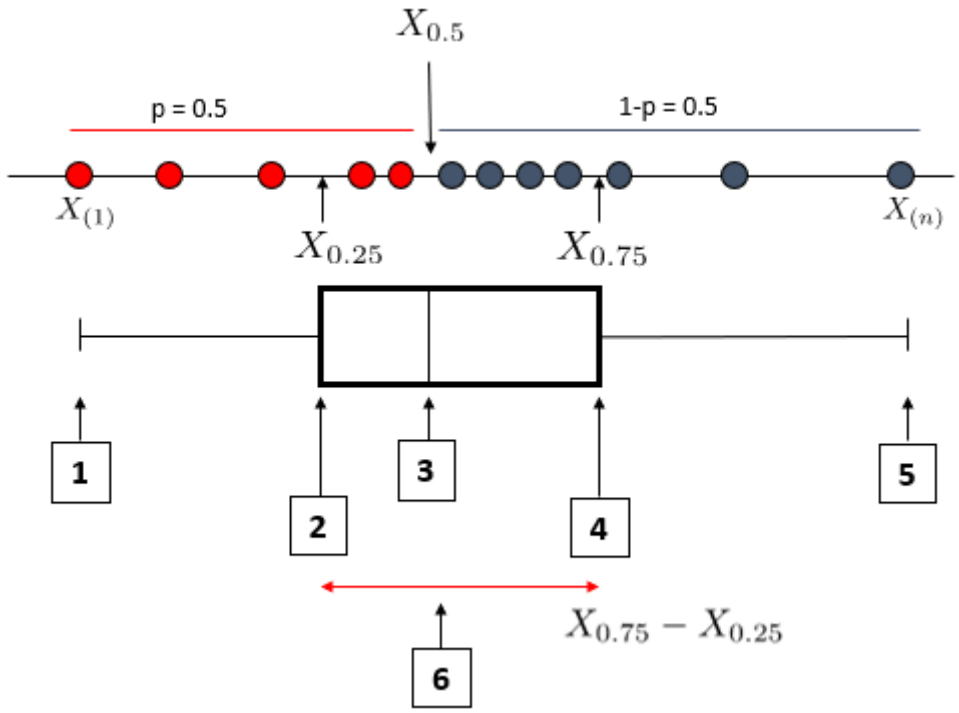
Mode passt zu The most frequent score, describes how most people behave
Mode passt zu Easy to calculate and understand; can be used with nominal data
Mode passt zu Independent from other data in the set; Can change dramatically when adding only one dataset
Median passt zu Middle score of a distribution
Median passt zu Relatively unaffected by outliers and skewed distributions
Median passt zu Can be used with ordinal, interval and ratio data
Median passt zu Does not consider all scores of the data set
Mean passt zu Avergae, sum of all scores devided by number of scores
Mean passt zu Consideres every score, therefore most accurate summary of the data

Mean	passt zu	Resistent to sampling variation
Mean	passt zu	Affected by extreme scores and skewed distributions
Mean	passt zu	Can only be used with interval and ratio data

Find the correct statements about when to use Bonferroni correction.

Ausgewählt	When multiple groups are compared
Nicht ausgewählt	When two groups are compared
Ausgewählt	Compensation for increased likelihood of performing a Type I error
Nicht ausgewählt	Compensation for increased likelihood of performing a Type II error

Name the components of a boxplot.



1. Minimum
2. First quartile oder 1st quartile
3. Median
4. Third quartile oder 3rd quartile
5. Maximum
6. Interquartile range oder IQR

Name the three components of the DIA cycle.

- Design
- Implement oder Implementation
- Analyze oder Analysis

Complete the following statements about storyboards.

- A series of sketches showing how a user might progress through a task using the device
- Often used with scenarios, bringing more detail, and a chance to role play
- Used early in design
- Users can quickly evaluate interaction flow

Assign the correct descriptions, advantages, and disadvantages to the different types of experimental design.

Between-group design passt zu Also called independent-measures design; Participants are assigned to one condition only
Between-group design passt zu Less chance of practice or fatigue effects; Useful when it is impossible for an individual to participate in all conditions
Between-group design passt zu Expense (time, effort, and number of participants); Insensitiveness to experimental manipulations
Within-subject design passt zu Also called repeated-measures design; Participants are assigned to all conditions; Order must be counter-balanced or randomized
Within-subject design passt zu Sensitiveness; Cancelling out individual differences
Within-subject design passt zu Carry-over effects from previous conditions; Conditions need to be reversible
Hybrid designs passt zu Combines aspects of between-group design and within-subject design

Assign the correct statements to either horizontal or vertical prototypes.

Horizontal prototype passt zu Displays “breadth” of functionality
Horizontal prototype passt zu Actual functions are not implemented
Horizontal prototype passt zu
Demonstrates feature space of product
Horizontal prototype passt zu Helps to evaluate/test navigation, feature placement, accessibility, overall user interface concept, user preferences
Horizontal prototype passt zu Used in early design stages

Vertical prototype passt zu Full functionality and performance of a “slice” or small part of the system
Vertical prototype passt zu Demonstrate a selected feature of a product
Vertical prototype passt zu Details of the function/feature are implemented
Vertical prototype passt zu Helps to evaluate/test the optimal design for a feature and its usability, user performance for this feature
Vertical prototype passt zu Used in early (to compare) and later design stages (to optimize) versions of a feature

Assign the correct descriptions to independent and dependent variables.

Independent variables (IV) passt zu The manipulated aspects, e.g. user interface layout, type of keyboard, ...
Dependent variables (DV) passt zu The observed aspects, e.g. task completion time, words per minute, ...

Name the four main input channels (human to computer).

1. Haptic
2. Speech
3. Vision
4. Affective computing

Name the relevant factors in the analysis of user interfaces.

- Goals of the project
- People involved in the operation of the system
- Processes that are improved, changed, or replaced
- Economic constraints
- Organizational constraints and company/customer policies

Select the correct statements about how to create a focus group.

Ausgewählt	Focus groups are usually not representative
Ausgewählt	Balance between similarity and productive heterogeneity
Ausgewählt	Do not set up a group where everyone has the same views, some diversity is useful
Ausgewählt	Too large groups don't allow to involve all participants
Ausgewählt	Too small groups don`t generate a discussion
Nicht ausgewählt	Mix people that are at different levels in company hierarchy
Nicht ausgewählt	Mix people that have very opposite views
Nicht ausgewählt	Rather use larger groups to gather more opinions
Nicht ausgewählt	Smaller groups generate a better discussion

Name the data collection techniques fitting the given descriptions.

- Paper and pencil oder Pencil and paper
  (cheap and easy but unreliable)
- Audio, video recording oder Audio/video recording oder Audio / video recording
  (cheap and easy, but creates lots of data and may be expensive to analyze)
- Photos
- Computer logging
  (reliable and accurate, but actions may be limited)
- User notebook
  (user keeps diary style protocol, but may be very tedious)

Fill the gaps in the given table describing the physical properties used by input devices (Card).

Linear	Rotary	
Position		
Absolute	P (Position) oder Position oder P	R (Rotation) oder Rotation oder R
Relative	dP	dR
Force		
Absolute	F (Force) oder Force oder F	T (Torque) oder Torque oder T
Relative	dF	dT

Give two advantages and two disadvantages of focus groups.

Advantages:

- Wide range of information
- In-depth information
- Possibility to explore related topics or go into more detail
- Cheap and easy

Disadvantages:

- Sampling of participants is not random nor representative
- the moderator plays a significant role and can influence the results
- No quantitative information can be gathered
- Findings can not be easily generalized

Name the five main output channels (computer to human).

- Vision
- Haptic
- Audio
- Smell/Taste
- Activating the human body

Name the four criteria to asses input devices by Buxton

- Continuous vs discrete
- Agent of control (hand, foot, voice, eyes ...) oder Agent of control
- What is being sensed (position, motion or pressure) oder What is being sensed oder What is sensed
- The number of dimensions being sensed (1, 2 or 3) oder The number of dimensions being sensed oder Number of dimensions being sensed oder Number of dimensions

Name three ways of showing 3D content to the user.

- Glasses with a separate display for each eye oder Glasses with separate display for each eye
- Having a screen/projection and electro optical shutter oder Screen/projection and electro optical shutter oder Screen and electro optical shutter oder Projection and electro optical shutter
- Linear polarization filters and passive spectacles for 3D projection oder Linear polarization filters and passive spectacles oder Linear polarization filters

Complete the given statements about diary studies by filling the gaps.

- Users are asked to keep a diary of their **interactions** with a computer system
- Users are asked to document for example **significant events or problems** during the use of the system
- Users are typically asked to record the **date and time** of an event, where they are, information about the event of significance, and ratings about how they feel, etc.

Find the correct statements about task analysis.

Ausgewählt	Used to analyze work processes and interactions
Ausgewählt	Analysis of all actions performed by the user to accomplish a task
Ausgewählt	Tasks are split into smaller sub-tasks
Ausgewählt	The granularity and level of detail should be suitable for the analyzed task
Nicht ausgewählt	Used to analyze typical users
Nicht ausgewählt	Analysis of the mental processes of the user while performing a task
Nicht ausgewählt	The more granularity and level of detail can be achieved, the better

Name some ways to generate haptic output.

- Vibration
- Mechanical forces / motion
- Shape change
- Stroking motion
- Temperature change
- Air pressure / flow
- Electrical signals

Fill the gaps to complete the given statements about focus groups.

- **Informal group gatherings oder Informal group** gathering of 6 to 12 people
- Focus on **a specific** topic
- Group discussion as means of communication
- Gather **qualitative** data from a group of people
- Get indication how people **think and**
- Get examples and **rich oder detailed** descriptions
- Understand why people act or react in a certain way
- Can be used in different project phases**, is not** suitable for formal evaluation

Fill the gaps to complete the given statements about ethnographic observation in HCI.

- Ethnographic observation in HCI is a way of **data collection**
- Potential users (typical users) are observed over a **period of hours, days, or weeks** (critical times are included, e.g. shift change)
- Goal: Acquisition of information that is required to create suitable **user interfaces oder UIs** and
- Risk: **Misinterpretation** of observations, **overlooking / missing** important facts, changing people's behaviour

Find the correct statements about Mixed Reality.

Ausgewählt Real enhancement of the virtual world
Ausgewählt Combination of real environment and virtual reality
Ausgewählt Interaction with mixed reality objects whether they are real, virtual or a mix of both
Ausgewählt Coupling real world phenomena to various information, represented within a computer
Nicht ausgewählt Consisting only of real objects
Nicht ausgewählt User is completely immersed
Nicht ausgewählt Interaction with a completely synthetic world

Fill the gaps to complete the statements about capacitive sensing for garment-based sensing principles.
Capacitor stores energy in an **electric field**
Physics principle:
Parallel plate capacitor and **human body** as dielectric
Material: conductive plane
Use-cases:
Textile integrated systems to measure **heart rate**
Current research focusing on measurement of single channel **ECG** and **respiration**

Complete the following descriptions of head-mounted displays.
See-through HMD

- Used in **Augmented Reality**
- Show **computer generated images** on real objects
- **Additional virtual** information to real world

Opaque HMD

- User **cannot** see the real world anymore
- View is **totally oder party** replaced with image of the virtual environment

Name three tracking systems.

- Magnetic trackers
- Optical trackers
- Acoustic trackers
- Mechanical trackers
- Inertial trackers

Fill the gaps to complete the statements about resistive sensing for garment-based sensing principles.
Measure **force intensity** on the **fabric surface**

Physics principle:

- Flexible **carbon polymer** (conductive, force sensitive, Carbotex fabric)
- **Pressure mapping**

Fill the gaps to complete the definition of Wearable Computing (Steve Mann).
Wearable Computing:
A computer **on the body** that is

- Always **on**
- Always **accessible**
- Always **connected**

Name five application areas of Virtual Reality.

- Military
- Eduaction
- Healthcare
- Entertainment
- Fashion
- Business
- Engineering
- Sport
- Media
- Telecommunications
- Construction
- Film

Assign the correct descriptions to the different levels of the Reality-Virtuality Continuum.

Virtual Environment	passt zu	User is totally immersed
Virtual Environment	passt zu	Completely synthetic world
Virtual Environment	passt zu	Possibility to step out of bounds of physical reality
Real-World Environment	passt zu	Constrained by laws of physics
Real-World Environment	passt zu	Consisting of real objects
Mixed Reality Environment	passt zu	Real and virtual objects are presented together in one display
Mixed Reality Environment	passt zu	Augmented Reality & Augmented Virtuality

Assign the correct descriptions to the toe-in method and the off-axis method for rendering two stereo pairs.

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