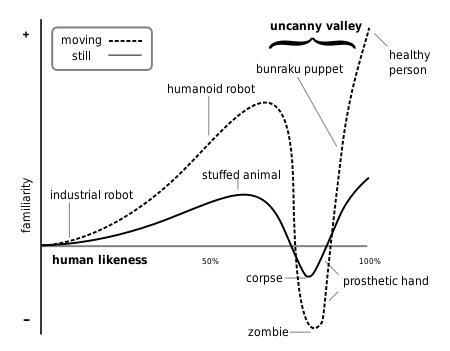
**THE UNCANNY VALLEY**

The **uncanny** valley is a **hypothesis** in the field of robotics and 3D computer animation,which holds that when human **replicas** look and act almost, but not perfectly, like actual human beings, it causes a **response** of **revulsion** among human observers. The "valley" in question is a **dip** in a proposed graph of the positivity of human reaction as a function of a robot's human likeness.

The term was **coined** by the robotics professor Masahiro Mori. Mori's original hypothesis states that as the appearance of a robot is made more human, a human observer's emotional response to the robot will become increasingly positive and **empathic**, until a point is reached beyond which the response quickly becomes that of strong revulsion. However, as the appearance continues to become less **distinguishable** from a human being, the emotional response becomes positive once more and approaches human-to-human **empathy** levels.

This area of repulsive response **aroused** by a robot with appearance and motion between a "barely human" and "fully human" **entity** is called the uncanny valley. The name captures the idea that an almost human-looking robot will seem overly "strange" to a human being and thus will fail to evoke the empathic response required for productive human-robot interaction.

[](http://en.wikipedia.org/wiki/File:Mori_Uncanny_Valley.svg)

The uncanny valley is the region of negative emotional response towards robots that seem "almost human". Movement **amplifies** the emotional response.

A number of design principles have been proposed for avoiding the uncanny valley. For example, design elements should match in human realism. A robot may look uncanny when human and nonhuman elements are mixed. For example, both a robot with a human voice or a human being with a synthetic voice have been found to be **eerier** than a robot with a synthetic voice or a human being with a human voice. For a robot to give a more positive impression, its degree of human realism in appearance should also match its degree of human realism in behavior. If an animated character looks more human than its movement, this gives a negative impression.

Good design can lift human-looking entities out of the valley. David Hanson has criticized Mori's hypothesis that entities approaching human appearance will necessarily be evaluated negatively. He has shown that the uncanny valley could be flattened out by adding **neotenous**, cartoonish features to the entities that had formerly fallen into the valley.

Povzeto in prirejeno po viru: http://en.wikipedia.org/wiki/Uncanny\_valley

**EXERCISES**

1. **Are the following statements true or false? Mark them with T or F.**
2. The uncanny valley is a place in the middle of a field.
3. Robots that are almost lifelike, but not quite, cause a negative reaction in people.
4. Professor Mori came up with the expression ‘uncanny valley’.
5. The graph shows a relation between the human likeness of robots and their functionality.
6. Uncanny valley effect cannot be avoided.
7. **Answer the questions.**
8. What kind of a response does the uncanny valley effect produce in humans?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why would an emphatic response to robots be required?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Who has critized Mori’s hypothesis?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What causes greater negative response, a moving or a still robot?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Translate the following expressions into Slovene.**

RESPONSE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ APPEARANCE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CORPSE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ FAMILIARITY \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

APPROACH \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ DEGREE \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Match the following expressions with the correct definitions.**

1. empathy a. a highly probable explanation

2. arouse b. a copy closely resembling the original

3. neotenous c. a feeling of violent disgust

4. eery d. an ability to recognize and share feelings

5. replica e. to stir up or excite

6. hypothesis f. inspiring fear, mysterious

7. revulsion g. showing juvenile characteristics in adults

1. **Find the words from the text in the square (all directions are possible).**

X Y M N M R O X N U E G Z L R

Z X V Q Q P E O F O U F C E Y

X X S K M U I S M B E D P U T

Q E D P G S O S P K P L D N I

R J E E L J X I C O I E I C T

L I I U Q M O S P C N I K A N

E U V O F L K E A X V S S N E

F E T R H M Y H T A P M E N E

R D F G U S H T Y X H B T Y A

A N I M A T I O N N S R Q M T

H J U T M C K P G A E Q C O N

N O M Z C V T Y F X L T B Y Q

X V Y J K J Q H W S K O O Y W

D I T R D C M V V P R H S E S

V I O L X K V J J T Q O B D N

ANIMATION

EMPATHY

ENTITY

HYPOTHESIS

NEOTENY

UNCANNY

REPLICA

RESPONSE

REVULSION

ROBOT

1. **Read the following paragraph on neoteny and then look up all the words in bold type in a dictionary and write the definitions bellow.**

Neoteny, also called juvenilization or pedomorphism, is the **retention**, by adults in a species, of **traits** previously seen only in **juveniles**. These are neotenous traits in humans: flattened face, broadened face, large brain,hairless body,hairless face, small nose,**reduction** of brow ridge, small teeth, small upper jaw (maxilla),small lower jaw (mandible),**epicanthic** eye fold (present in all people in the **embryonic** stage), thinness of skull bones,**limbs** proportionately short compared to **torso** length, longer leg than arm length, larger eyes,and upright **stance**.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Something to think about; could the uncanny valley effect be used in a motion picture or a 3D computer animation deliberately? And why? To what purpose? Discuss it with a partner and write down your conclusions.**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

KEY TO THE EXERCISES

1.) a-false, b-true, c-true, d-false, e-false

2.) a-negative/revulsion, b-for productive human-robot interaction, c-David Hanson,d-moving

3.) odziv, izgled, truplo, podobnost, pristop, stopnja

4.) 1-d, 2-e, 3-g, 4-f, 5-b, 6-a, 7-c

5.)

+ + + + + R + + N + + + + + R

+ + + + + + E O + + + + + E Y

+ + + + + + I S + + + + P U T

+ + + + + S + S P + + L + N I

+ + + + L + + I + O I + + C T

+ + + U + + + S + C N + + A N

+ + V + + + + E A + + S + N E

+ E + + + + Y H T A P M E N +

R + + + + + + T Y + + + + Y +

A N I M A T I O N N + + + + T

+ + + + + + + P + + E + + O +

+ + + + + + + Y + + + T B + +

+ + + + + + + H + + + O O + +

+ + + + + + + + + + R + + E +

+ + + + + + + + + + + + + + N

(Over,Down,Direction)

ANIMATION(1,10,E)

EMPATHY(13,8,W)

ENTITY(15,7,N)

HYPOTHESIS(8,13,N)

NEOTENY(15,15,NW)

REPLICA(15,1,SW)

RESPONSE(6,1,SE)

REVULSION(1,9,NE)

ROBOT(11,14,NE)

UNCANNY(14,3,S)

Naloga narejena na strani http://www.discoveryeducation.com/free-puzzlemaker/.