

GAT 315

3D Game Design I

Instructor

- Rich Rowan
- rrowan@digipen.edu
- Cell: 206-898-2955

Office Hours

- Tuesday 3pm-4:30pm
- Thursday 1pm-3pm



Emotions: Fear & Disgust

- ☐ Emotional Theories
- ☐ Fear
- ☐ Disgust

**PLEASE SILENCE
ALL ELECTRONIC DEVICES**

THANK YOU





EMOTIONS

Basics of Human Emotions

The Big Six - Basic Human Emotions



According to modern psychology, emotion, behavior and cognition influence each other.

Paul Ekman and others have identified six innate human emotions, as distinguished from secondary or learned emotions, based on universal facial expressions:

- **Happiness**
 - Various degrees of positive feelings ranging from satisfaction to extreme joy.
- **Sadness**
 - Expresses a state of loss and difficulty.
- **Anger**
 - Dislike or opposition toward a person or thing that is considered the cause of aversion.
- **Fear**
 - Reaction to an actual and specific source of danger.
- **Disgust**
 - Reaction to things that are considered dirty, revolting, contagious, contaminated, and inedible. It is divided into two categories: physical disgust and moral disgust.
- **Surprise**
 - Emotion that arises when an individual comes across an unanticipated situation. Usually lasts a fraction of a second.

The Big Six – Facial Expressions



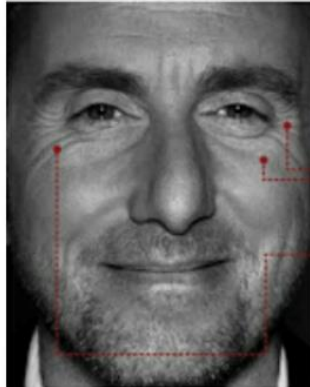
sadness

- ① drooping upper eyelids
- ② losing focus in eyes
- ③ slight pulling down of lip corners



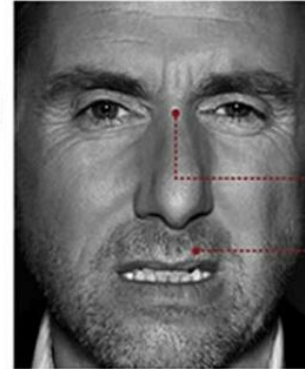
anger

- ① eyebrows down and together
- ② eyes glare
- ③ narrowing of the lips



happiness

- A real smile always includes:
- ① crow's feet wrinkles
 - ② pushed up cheeks
 - ③ movement from muscle that orbits the eye



disgust

- ① nose wrinkling
- ② upper lip raised



surprise

- Lasts for only one second:
- ① eyebrows raised
 - ② eyes widened
 - ③ mouth open



fear

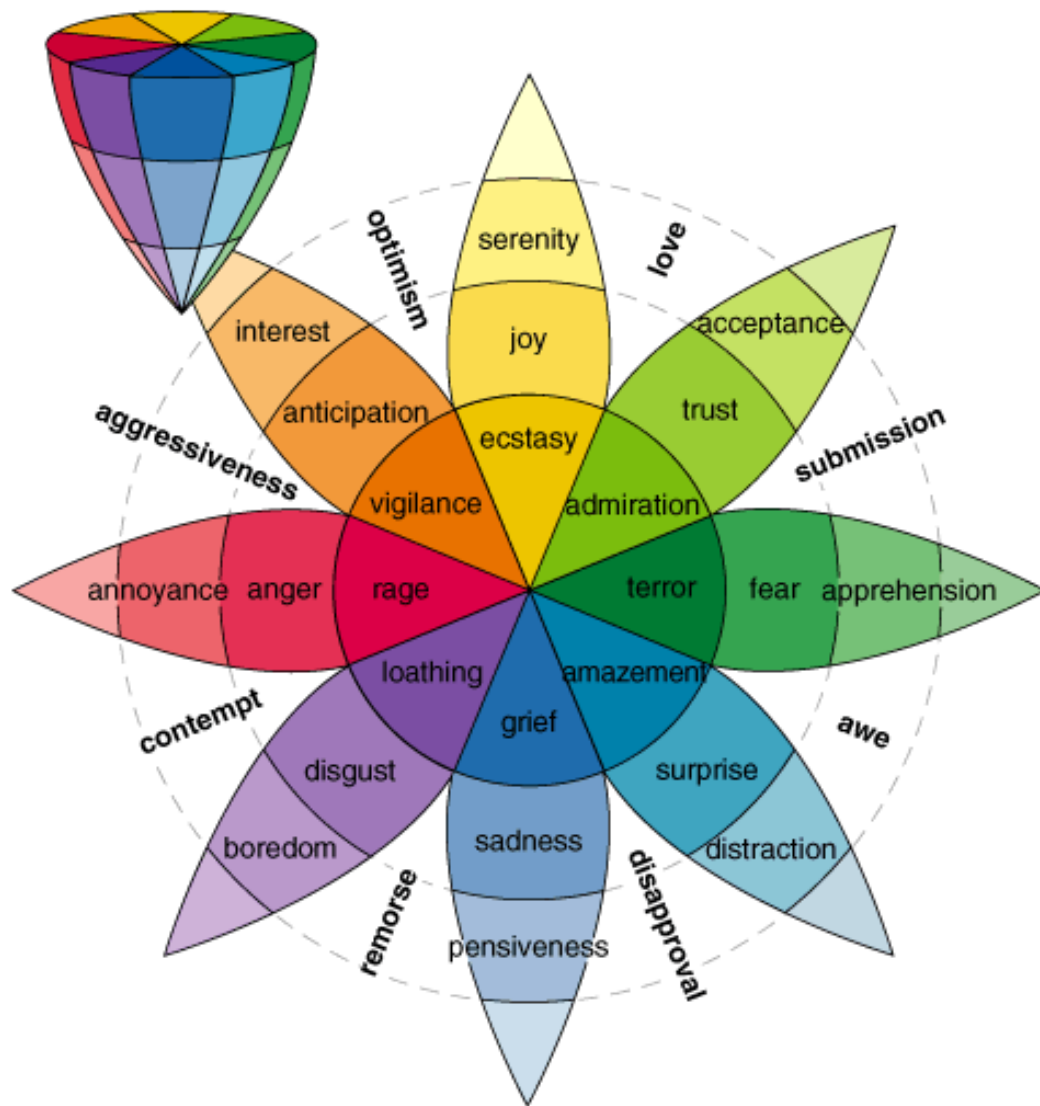
- ① eyebrows raised and pulled together
- ② raised upper eyelids
- ③ tensed lower eyelids
- ④ lips slightly stretched horizontally back to ears

Plutchik's Ten Postulates



1. **Universal:** Applicable to all evolutionary levels and applies to all animals including humans.
2. **Evolutionary History:** Have evolved various forms of expression in different species.
3. **Survival Issues:** Help organisms deal with key survival issues posed by the environment.
4. **Prototype Patterns:** Common elements can be identified across species despite different forms of expression.
5. **Basic Emotions:** There are a small number of basic, primary, or prototype emotions.
6. **Combinations:** All other emotions are mixed or derivative states of the primary emotions.
7. **Hypothetical Constructs:** Primary emotions are idealized states whose properties and characteristics can only be inferred from various kinds of evidence.
8. **Opposites:** Primary emotions can be conceptualized in terms of pairs of polar opposites.
9. **Similarity:** All emotions vary in their degree of similarity to one another.
10. **Intensity:** Each emotion can exist in varying degrees of intensity or levels of arousal.

Robert Plutchik's Wheel of Emotions



Joy	Sadness
Anger	Fear
Anticipation	Surprise
Trust	Disgust

Plutchik's Wheel of Emotions



And More Theories of Basic Emotions...



Theorist	Basic Emotions
Arnold	Anger, aversion, courage, dejection, desire, despair, fear, hate, hope, love, sadness
Frijda	Desire, happiness, interest, surprise, wonder, sorrow
Gray	Rage and terror, anxiety, joy
Izard	Anger, contempt, disgust, distress, fear, guilt, interest, joy, shame, surprise
James	Fear, grief, love, rage
McDougall	Anger, disgust, elation, fear, subjection, tender-emotion, wonder
Mowrer	Pain, pleasure
Oatley and Johnson-Laird	Anger, disgust, anxiety, happiness, sadness
Panksepp	Expectancy, fear, rage, panic
Tomkins	Anger, interest, contempt, disgust, distress, fear, joy, shame, surprise
Watson	Fear, love, rage
Weiner and Graham	Happiness, sadness

Mirror Neurons and Emotional Contagion



- Primates and other animals have mirror neurons.
- A mirror neuron is a neuron that fires both when an animal acts and when the animal observes the same action performed by another. Thus, the neuron "mirrors" the behavior of the other, as though the observer were itself acting.
- The phrase "emotional contagion" embodies the idea that humans will synchronize their personal emotions with the emotions expressed by those around them, whether consciously or unconsciously, and thus that an emotion conveyed by one person will become "contagious" to others.
- This can be used in games to transfer emotional body language from an onscreen character to the player.



FEAR

Understanding the Psychology & Physiology of Fear

What is Fear?



Fear is a feeling induced by perceived (actual or anticipated) danger or threat that causes a change in metabolic and organ functions, modulated by the process of cognition and memory.

The fear response serves survival by generating appropriate behavioral responses, so it has been preserved throughout evolution. Fear results in one of three primary behaviors:

- **Fleeing**
- **Freezing**
- **Hiding**

In the event that none of these three are a viable defense option (such as when trapped or cornered), a fourth behavioral response may emerge:

- **Fighting**

Anxiety & Phobias



Fear responses are often judged as rational/appropriate and irrational/inappropriate.

Rational fears are generated when a specific imminent threat occurs that is a legitimate risk to body, life, or social belonging.

Irrational fear, or anxiety, occurs when there is not a specific imminent threat to body, life, or social standing. Anxiety encompasses four aspects:

- Mental apprehension
- Physical tension
- Physical symptoms
- Dissociation

Generalized anxiety does not have a specific focus, but extreme fear or anxiety about specific triggers are called phobias. Between 5% and 12% of the population worldwide suffer from phobic disorders.

Physiology of Fear



Fear is an automatic response that activates of your sympathetic nervous system with the release of adrenaline and noradrenaline to prepare your body for a fight or flight response.

- Oxygen is needed to prepare a person to move and increases respiration so air passages dilate resulting in **heavier breathing** and the **heart pumps faster** to get the oxygen to the arms and legs (and brain).
- As a person heats up due to increased oxygen and heart rate, **sweating occurs**.
- Since blood is going more to the large muscles in the arms and legs, reduced blood flow to other parts of the body, including skin, can cause **tingling, numbness, or chills/hot flashes**.
- Other systems not needed for immediate survival, like the gastrointestinal system, shut down. Excess **stomach acid or nausea are very common, as is relaxation of muscles controlling urinary and bowel function**.
- **Pupils dilate to increase the visual field**, producing loss of visual acuity for fine details.
- As the body gears up to fight or flee (or to engage in high activity) an imbalance is created when the high activity does not take place. The oxygen is in excess of what is really needed, producing **symptoms of lightheadedness, dizziness, feeling unreal, and blurred vision**.

Sound of Fear



Audio is critical to conveying a sense of fear. Sound is closely associated with emotion, and nothing triggers fear like sound.

At least 50% of what makes movies or games scary is the sound design. Try watching a scary movie clip with the sound off...

- **Nonlinear sound mimics the sound of frightened animals**
 - Screech of violins in Psycho
 - Shark sound in Jaws
- **Startle reflex from sudden or unexpected sounds (or silence)**
 - Sounds travel faster than light through our brains
 - Vision is heavily processed by the brain, but sound only travels through five nerves – we react to sound before we even know what we're seeing
 - This is a survival reflex developed to protect us from predators.

Sound of Fear

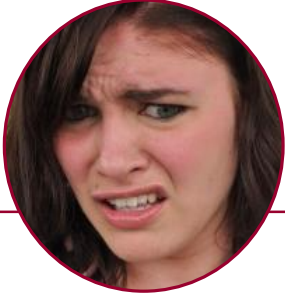


- **Unnaturally low or high pitched sounds**
 - Sound under 20Khz can't be detected consciously, but will still make the listener feel uneasy
 - Low sounds (like rumbling) sound like predators. High pitches sound like distress.
- **Use music to reinforce the mood**
 - Minor chords sound more mysterious, scary, and sad than major chords. Funeral marches are usually in minor chords.
 - Toccata in Fugue and O Fortune are D minor
 - Harry Potter theme is E minor
- **Increase tempo of music/sound**
 - Subconsciously mimics faster heart rate and heavier breathing.



DISGUST

What is Disgust?



- Disgust is an emotional response of revulsion to something considered offensive, distasteful, or unpleasant.
- Disgust is experienced primarily in relation to the sense of taste (either perceived or imagined), and secondarily to anything which causes a similar feeling by sense of smell, touch, or vision.
- Research has proven a relationship between disgust and some anxiety disorders (e.g., arachnophobia).
- It is believed that the emotion of disgust has evolved as a response to offensive foods that may cause harm to the organism.

Domains of Disgust



Tyber, et al (2009) outlines three domains of disgust

- **Pathogen Disgust**
 - Motivates the avoidance of infectious microorganisms
 - Acts as a "behavioral immune system"
- **Sexual Disgust**
 - Motivates the avoidance of “biologically costly mates” and behaviors
 - The two primary considerations are intrinsic quality (e.g. body symmetry, facial attractiveness, etc.) and genetic compatibility (e.g. avoidance of inbreeding)
- **Moral Disgust**
 - Motivates people to avoid breaking social norms
 - Disgust may have an important role in certain forms of morality

"Microbes, mating, and morality: Individual differences in three functional domains of disgust". *Journal of Personality and Social Psychology* **97**

Pathogen Disgust Elicitors



Self-report and behavioral studies found that disgust elicitors include:

- **Body Products** (feces, urine, vomit, sexual fluids, saliva, and mucus)
- **Foods** (spoiled foods)
- **Animals** (fleas, ticks, lice, cockroaches, worms, flies, rats, and mice)
- **Hygiene** (visible dirt and "inappropriate" acts such as using an unsterilized surgical instrument)
- **Body Envelope Violations** (blood, gore, and mutilation)
- **Death** (dead bodies and organic decay)
- **Visible Signs of Infection**

Kitty Litter Cake



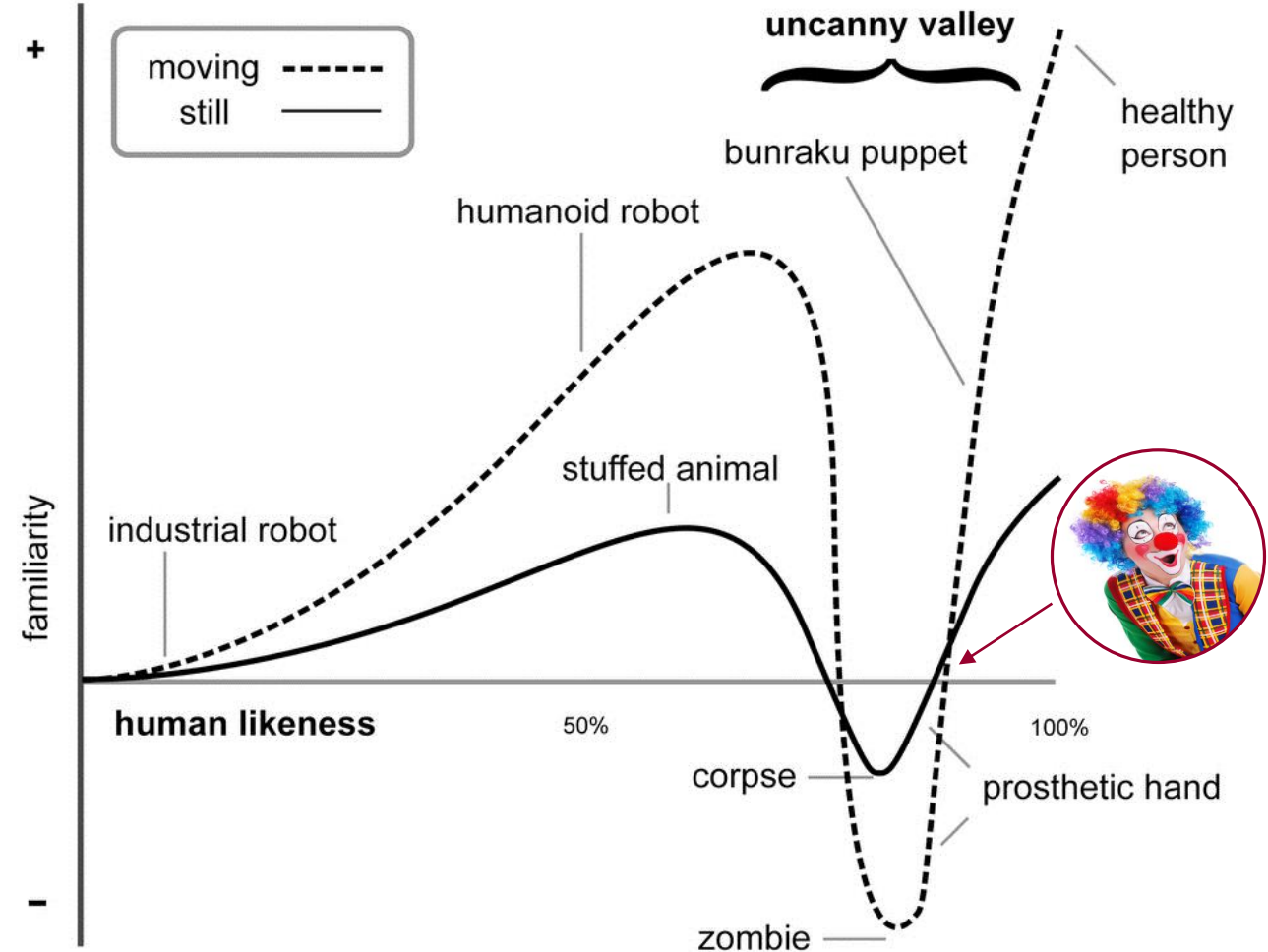
Bonus Challenge

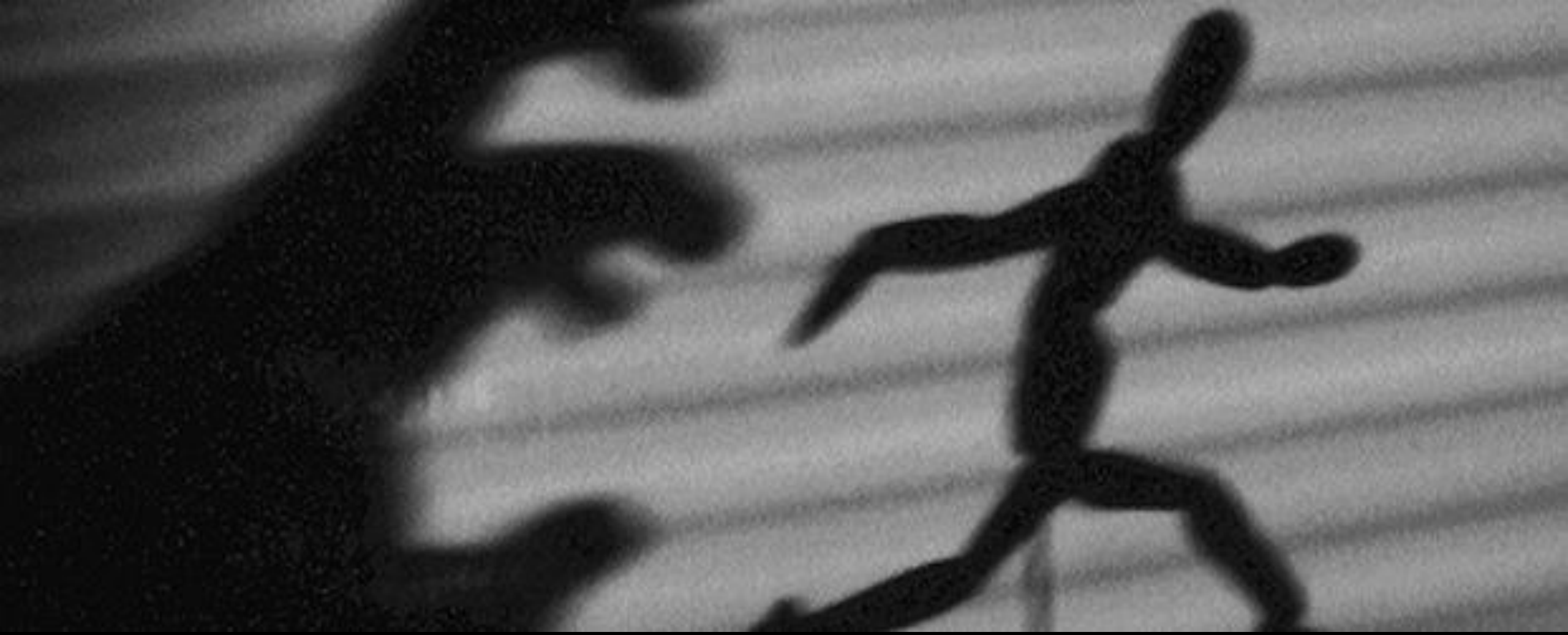
Try and find a picture on the web of someone about to eat this cake (as opposed to posing with it) that does NOT have a look of disgust on their face.

Uncanny Valley

The uncanny valley is a hypothesis in the field of aesthetics which holds that when features look and move almost, but not exactly, like natural beings, it causes a response of revulsion among some observers.

The "valley" refers to the dip in a graph of the comfort level of beings as subjects move toward a healthy, natural likeness described in a function of a subject's aesthetic acceptability.





DESIGNING FEAR

Design Techniques

- **Create an ominous mood**
 - Take people out of their comfort zone in setting (castles, forests, ghost towns, etc.)
 - Avoid warm colors and lighting (blue shift the lighting)
 - Make heavy use of shadows and darkness (people fear the unknown)
 - Unpleasant weather, especially weather that tends toward darkness and lack of visibility like rain and fog (lightning for bonus jump scares)
- **Carefully craft your audio**
 - Manage the sound tension carefully – allow room for sudden peaks and silence
- **Build tension through pacing**
 - This can be a slow build in tension, or sudden erratic shifts
 - Increase tempo at fearful moments
- **Subvert expectations**
 - Leverage surprise to create fear (jump scares, double jump scares, unexpected reveals)
 - Bring danger from an unexpected direction/source
 - Use unnatural camera angles
- **Leave things to the imagination**
 - Nothing is as scary as the monster unseen
 - Imply danger

A background image of red stage curtains with a scalloped top edge. The curtains are closed and have a rich, deep red color with some vertical creases and folds.

See You Next Class