Animations

Jaanus Jaggo
Animation in video games

https://www.dwarfblock.com/
Animation in video games

https://www.dwarfblock.com/
Animation principles

Image source: https://jadsit0221.wordpress.com/2015/03/22/principles-and-points-in-animation/
Squash & Stretch

The volume should stay the same!
Squash & Strench
Squash & Strech
Ease in / Ease out

STANDARD IN-OUT MOVEMENT

EASY EASE IN-OUT MOVEMENT

POSITION

TIME
Ease in / Ease out

https://www.youtube.com/watch?v=uDqJldI4bF4
Linear / Cosine interpolation

Vector2 LinearInterpolate(Vector2 p1, Vector2 p2, float mu)
{
    return(p1*(1-mu)+p2*mu);
}

Vector2 CosineInterpolate(  
    Vector2 p1, Vector2 p2,  
    float mu)
{
    float mu2 = (1-cos(mu*Mathf.PI)) / 2.0f;
    return(y1*(1-mu2)+y2*mu2);
}
Different curves for different things
Anticipation

Character prepares for the action to give a glue!

What the character here is preparing for?
Anticipation

How to let the player know that the trap is going to trigger?
Staging

https://www.youtube.com/watch?v=uDqjldl4bF4
Pose to Pose
Pose to Pose
Pose to Pose
Pose to Pose
Pose Design

https://www.youtube.com/watch?v=ZmLkVtqjf1A

Which pose is better, the left or the right?
Silhouetted posing

A good pose has some negative spacing and “reads” well. Good practice is to make sure that the pose looks good as a silhouette.

Pose Design

Which pose is the best?

https://www.youtube.com/watch?v=ZmLkVtqjf1A
Straight ahead
Combining

Pose-to-pose + Straight ahead
Combining

In video games you can combine physics based bones with regular ones.
Arcs
Arcs

Posing characters in C or S curve makes them more appealing.

Timing

http://www.youtube.com/watch?v=uDqjldl4bF4&t=16m10s
Overshooting

http://www.youtube.com/watch?v=iJOUTSy0fQI&t=9m24s
Overshooting

Makes hits and punches feel connected!

Street Fighter 3, GDC talk:
https://www.youtube.com/watch?v=Mw0h9WmBlsW
Exaggeration
Make it snappy: Lara Croft GO

http://www.youtube.com/watch?v=gn4MzuviDs&t=20m40s
Secondary action

Show secondary actions

No! I'm not angry at you!

No! I'm not angry at you!

for more life and meaning
Secondary motion - Follow through

Drag movement
Secondary motion
Quiz

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https://jadsit0221.wordpress.com/2015/03/22/principles-and-points-in-animation/
Quiz

Anticipation

Squash and stretch

Exaggeration

Staging

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https://jadsit0221.wordpress.com/2015/03/22/principles-and-points-in-animation/
Skyrim Mining animation analysis

Analysis begins at 1:48
Rotoscoping

What game is it?

https://www.youtube.com/watch?v=wKgLfqOVHco
Rotoscoping

https://www.youtube.com/watch?v=wKgLfqOVHco
Motion capture
Face animations

https://www.youtube.com/watch?v=kvCxyDwHeag&t=662s
Face animations

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Face animations

https://www.youtube.com/watch?v=kvCxyDwHeag&t=662s
Face animations

Motion capture gives the best results. But it is expensive!
Facial Motion Capture with Blender

Full tutorial video: https://www.youtube.com/watch?v=uNK8S19OSmA
3D face animations are hard to make

Bad face animations can look uncanny.
Animating quadruped characters

1. Animation speed

https://www.youtube.com/watch?v=Bs046-TWMhA
Animating quadruped characters

2. Animation direction

https://www.youtube.com/watch?v=Bs046-TWMhA
Animating quadruped characters

3. Blending from locomotion to idle

https://www.youtube.com/watch?v=Bs046-TWMhA
Video game animation technologies
3D character animations

Where are those characters from? Can you notice something?
Skinned meshes
This simple rig allows me to have hundreds of animated characters at once - video in the comment.
Kingdom rush - more animations = less frames
Anima 2D - Unity rigged 2D animations
Animating in Unity
Frame by frame animation - Pixelart

Make your characters simpler to save a lot of time.
Frame by frame animation - Pixelart

- Wire animation
- Shape animation
- Shaded animation

3D vs 2D animation

2D animations often just take too much effort.

Project zomboid technique: [https://theindiestone.com/binky/2012/11/26/mesh-enshrinkulation/](https://theindiestone.com/binky/2012/11/26/mesh-enshrinkulation/)
3D vs 2D animation

2D animations often just take too much effort.

Dead Cells technique:
Vertex color animations

alpha_channel  red_channel
Vertex color animations
Vertex color animations
UI animations

Can be used for:

- Emphasising important things
- Making UI feel responsive
- Giving context (objects doesn’t appear from nowhere but slide in)
- Making the game feel polished

In Unity you can define animation curves in the editor.
Practical tips for UI animations

Source: https://www.youtube.com/watch?v=LmXVxkWjLT8
Animated materials

Organic substances are usually animated in custom shaders.
Suggestions

Watch the 12 Principles of Animation:
https://www.youtube.com/watch?v=uDqjldI4bF4

Try Anima2D
https://www.assetstore.unity3d.com/en/#!/content/79840