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SE 432
3D ANIMATION IN COMPUTER GAMES

LECTURE 6- WALK CYCLE
Walks

Walking is a process of falling over and catching yourself just in time.

There's a tendency to lean in a walk. The slower it is, the more you're in balance - and the faster, more out of balance.
Walks

1. Contact
   - Each arm moves in coordination with the opposite leg, giving balance and thrust.

2. Going down
   - As we dip down, we speed up, releasing energy. Gravity is doing some of the work. Our arms are at their widest point.

3. Going up
   - We’re less than one centimeter away from stubbing our toe every time we take a step. Walking is naturally energy conserving. We lift our foot as little as possible.

4. Up
   - As we rise up, we slow down, we’re storing up potential energy.

5. Mediant
   - Our foot glides down heel first for a soft landing.

6. Going down again
   - Our calves produce horsepower every time we thrust forward. Our calf muscle puts out up to one horsepower (760 watts).
Walks
Walks

WE FEEL THE WEIGHT THEN THE MASS OF THE BODY COMES DOWN.

- ESPECIALLY WHEN IT'S PRECEDED BY A STRAIGHT -- WHERE THERE'S NO WEIGHT ON IT YET.

THEN IT TAKES THE WEIGHT \( \downarrow \)

AND WE GET THE 'CHANGE'
Normal Walk

First we'll make the 2 contact positions.
Normal Walk

Next well put in the passing position - the middle position or 'breakdown' - the half-way phase.

Passing position slightly higher than mid-point.
Normal Walk

Next comes the down position—where the bent leg takes the weight
Normal Walk

Next we put in the up position - the push-off.
Normal Walk
Normal Walk

- Hip and shoulder line oppose each other.
- On the passing position, hips and shoulders are more or less straight.
- Pass POS.
Normal Walk
Normal Walk Feet

DELAY - KEEPS FLAT

AND RELUCTANTLY LEAVES THE GROUND
Weight shift

CONTACT  THE DOWN  PASS POS, UP  CONTACT  THE DOWN  PASS POS UP  CONTACT

PLANTS THE FOOT  AND TAKES THE WEIGHT TO THE SIDE OVER THE FOOT  STRAIGHTENS - BUT THE LIFTED PASSING LEG CAUSES THE WEIGHT TO DROP ON ITS SIDE  PLANTS THE FOOT  AND TAKES THE WEIGHT TO THE SIDE OVER THAT FOOT  STRAIGHTENS - BUT THE LIFTED PASSING LEG CAUSES THE WEIGHT TO DROP ON ITS SIDE  PLANTS THE FOOT
Arcs

The wrist maintains the arc.

Pass pos.

Most actions follow arcs - generally an action is in an arc.
Arcs

GOING THIS WAY

AND COMING BACK
Arcs – breaking the joints

But here's the secret—

When we go forward we'll 'break' (bend) the elbow joint whether it looks right or wrong and whether it would bend that way or not.
Arcs – breaking the joints

AND WHEN WE COME BACK, WE’LL ‘BREAK’ BEND IT AGAIN – ALTHOUGH GOING THIS WAY IT LOOKS QUITE NORMAL – A NATURAL ‘BREAK’ OR BEND.
Arcs – breaking the joints

AND GOING BACK –

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PASS POS