Animation for Games

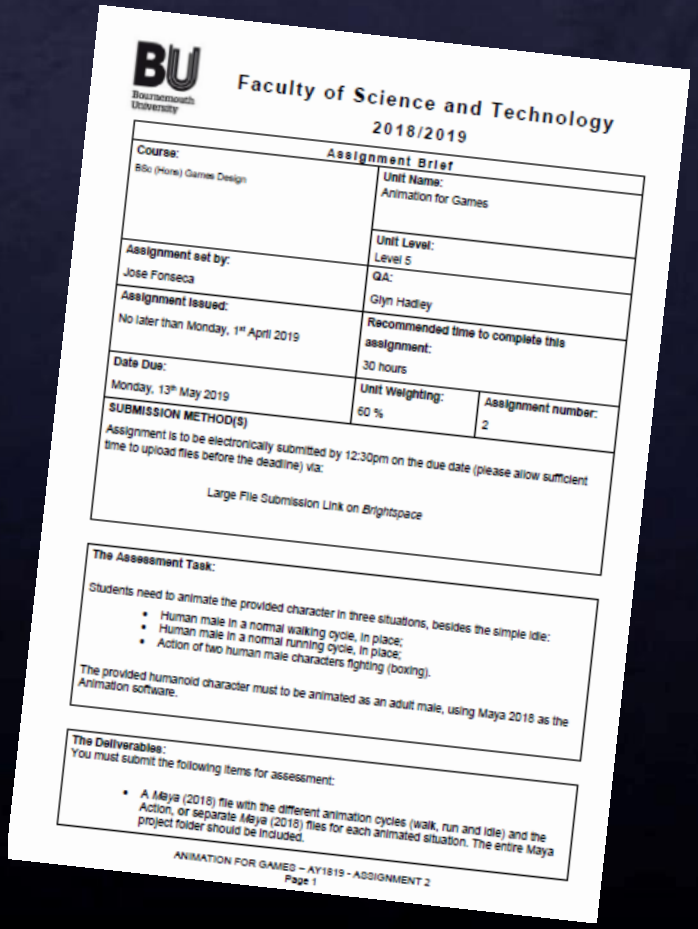
Week 8

Character Animation: Run Cycle

Jose Fonseca

Animation for games

Assignment Brief 2



Faculty of Science and Technology
2018/2019

Assignment Brief

Course: BSc (Hons) Games Design	**Unit Name:** Animation for Games
	Unit Level: Level 5
Assignment set by: Jose Fonseca	**QA:** Glyn Hadley
Assignment Issued: No later than Monday, 1st April 2019	**Recommended time to complete this assignment:** 30 hours
Date Due: Monday, 13th May 2019	**Unit Weighting:** 60 % / **Assignment number:** 2

SUBMISSION METHOD(S)

Assignment is to be electronically submitted by 12:30pm on the due date (please allow sufficient time to upload files before the deadline) via:

Large File Submission Link on *Brightspace*

The Assessment Task:

Students need to animate the provided character in three situations, besides the simple idle:

- Human male in a normal walking cycle, in place;
- Human male in a normal running cycle, in place;
- Action of two human male characters fighting (boxing).

The provided humanoid character must to be animated as an adult male, using Maya 2018 as the Animation software.

The Deliverables:

You must submit the following items for assessment:

- A *Maya* (2018) file with the different animation cycles (walk, run and idle) and the Action, or separate *Maya* (2018) files for each animated situation. The entire Maya project folder should be included.

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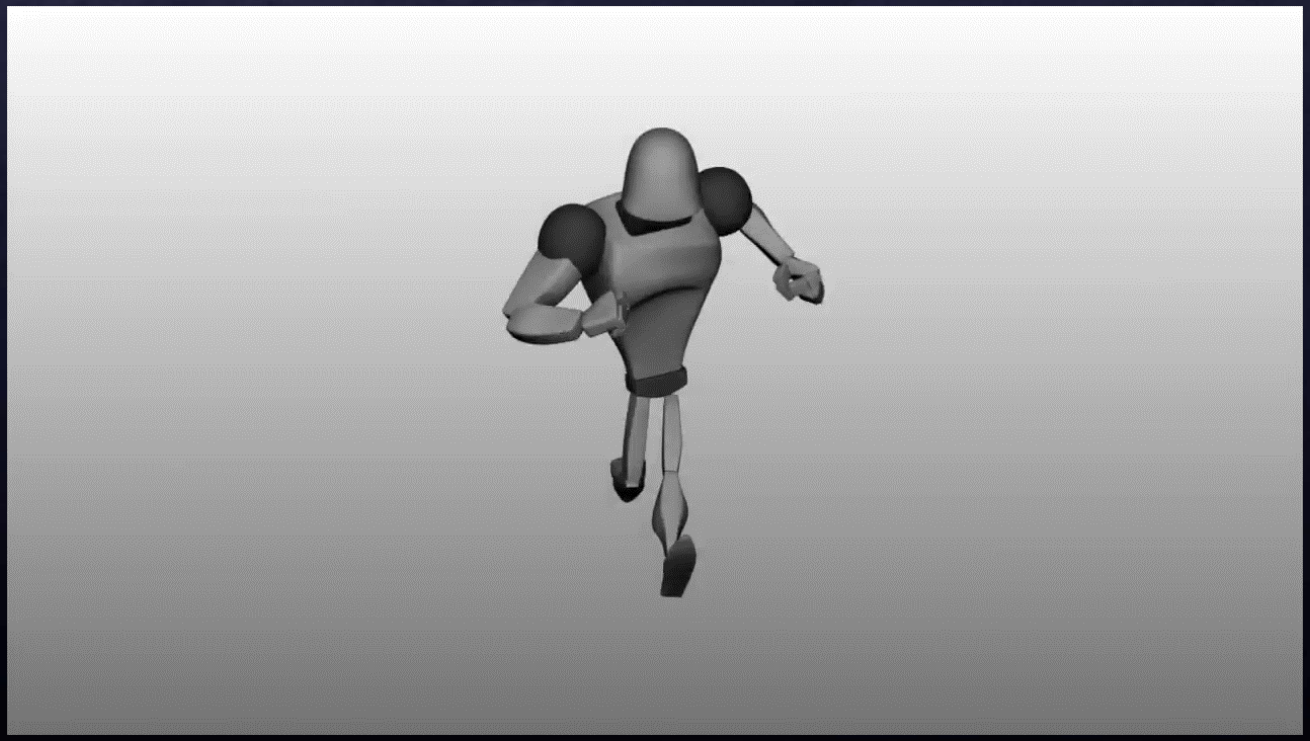
Run Cycle



https://www.youtube.com/watch?v=LBxvCYBcOH4&feature=youtu.be

Aims for this session

- Understand the importance of the run in Animation and for Games in particular;
- Know the run process in 3D Computer Animation;
- Understand the mechanics of the run in an orthograde biped, as a reference to character animation;
- Learn the creation of expressive run (*timing – rhythm*) using a rigged character.

Run

- How do people run?

Moses Mosop (Kenya) Running technique / Looptechniek

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

Animation for games

Run

- How do people run?

Slow Motion Study of Running At Different Speeds
https://www.youtube.com/watch?v=Zb_SizNRUPg

Run

- How do people run?

  What are the differences from a walk cycle?

by Eadweard Muybridge

Run

- How do people run?

  But common people run differently from professional runners

(Webster 2012, p. 245)

Run

- How do people run?

Similarly to walking, running is also about managing the balance of the body but in this case the unbalanced condition is even more critical – the body is supported by only one foot at a time; and in part of the motion both feet are off the ground.

Besides the suspension, running also requires the body to lean forward more than walking.

Animating a Run Cycle

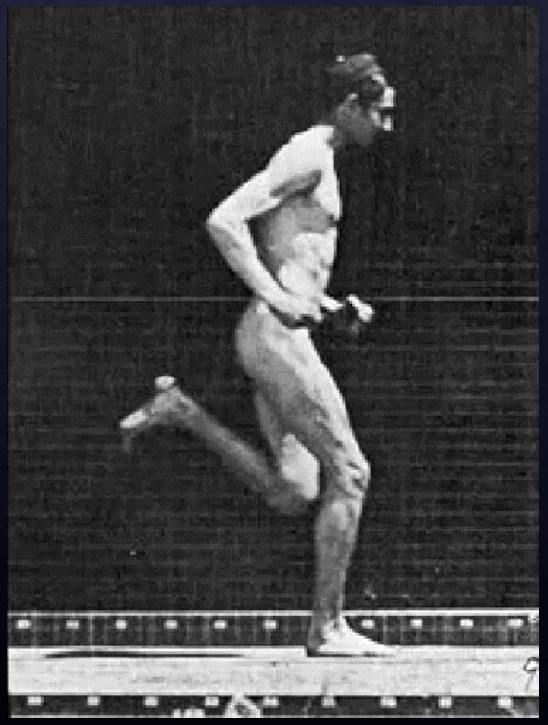
Therefore, a similar approach should be followed.

The main differences are:

- Duration – usually the Run takes half to two thirds of second;
- In the run, the Extreme poses are suspended and only the major Breakdown and the two adjacent Breakdowns are contacting with the ground;
- The lower position of the upper body occurs in the major Breakdown pose (run), instead of in the Extreme pose (walk).

Animation for games

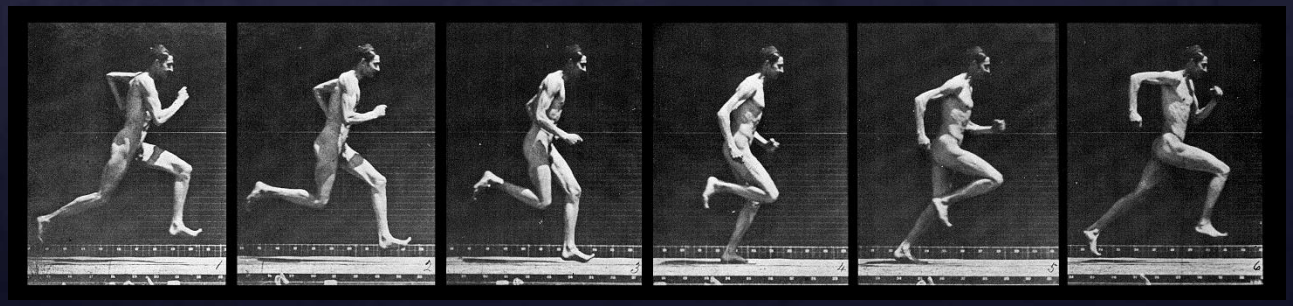
Breakdown of movement into its main poses



by Eadweard Muybridge

Animation for games

Breakdown of movement into its main poses

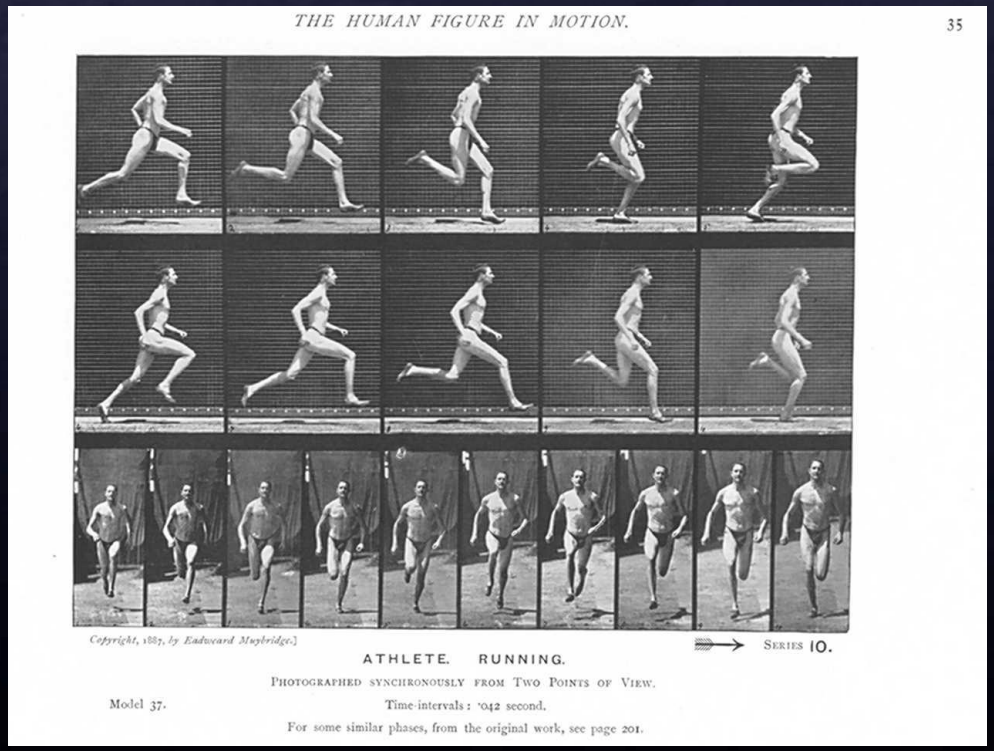


by Eadweard Muybridge

As an animator, you need to decompose each imagined movement into its poses and then create those poses for the animation software to interpolate and generate the in-betweens.

Animation for games

Breakdown of movement into its main poses



by Eadweard Muybridge

Run

Differently from the Walk Cycle, in the Run Cycle the Extremes are not contacting with the ground.

(a) (c) (b) (d)

Animation for games

Run

Only the major Breakdown (b), along with the two adjacent Breakdowns (c,d) do it.

(a) (c) (b) (d)

Run

Now, observe a sprinter…

Can you identify the Extremes, major Breakdowns (b), and Breakdowns (c,d)?

Animating a Run Cycle is a very difficult task

You need to approach the process in a very systematic way

It needs to produce a perfect loop – the start and end poses must match, or, to be more precise, the pose in the end frame must correspond to the pose immediately before the one in the start frame (otherwise it will produce a hold);

Any strange movement of a body part will be easily noticed when the repeated run motion is played.

Animation for games

Example of the main poses for each step of a run movement:

- Extreme (Suspension position or Stride), which is usually also a Key Pose – (a);
- Major Breakdown (Passing position) – (b).
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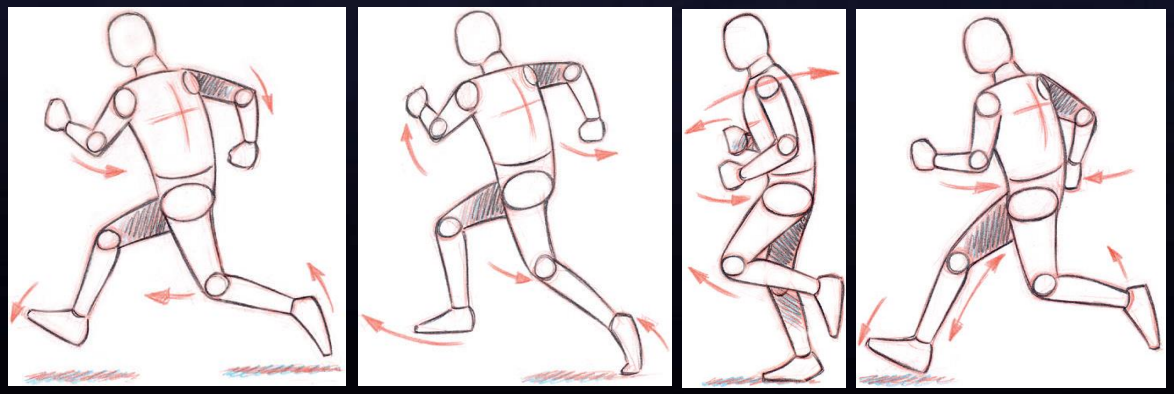
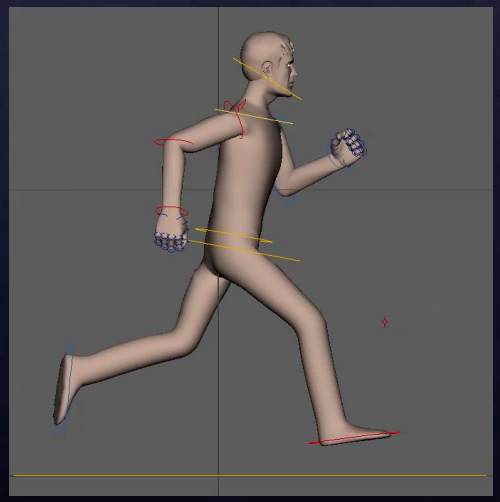


(a) (c) (b) (c)

Run Cycle, main poses (Webster 2012, pp. 238-247)

Animating a Run Cycle in place

The illusion of moving forward

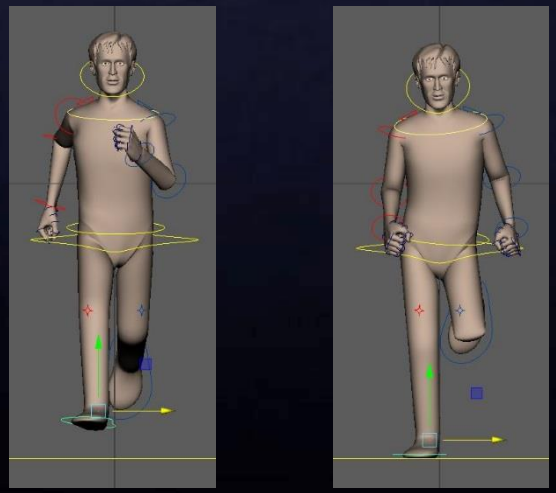


A 30 fps run

The supporting foot slides backwards at a constant speed (i.e. constant distance from one frame to the next).

Animating a Run Cycle in place

First, focus on the feet and legs – the arrangement of the body parts depends on which foot/leg is supporting the body at a moment of the run movement.

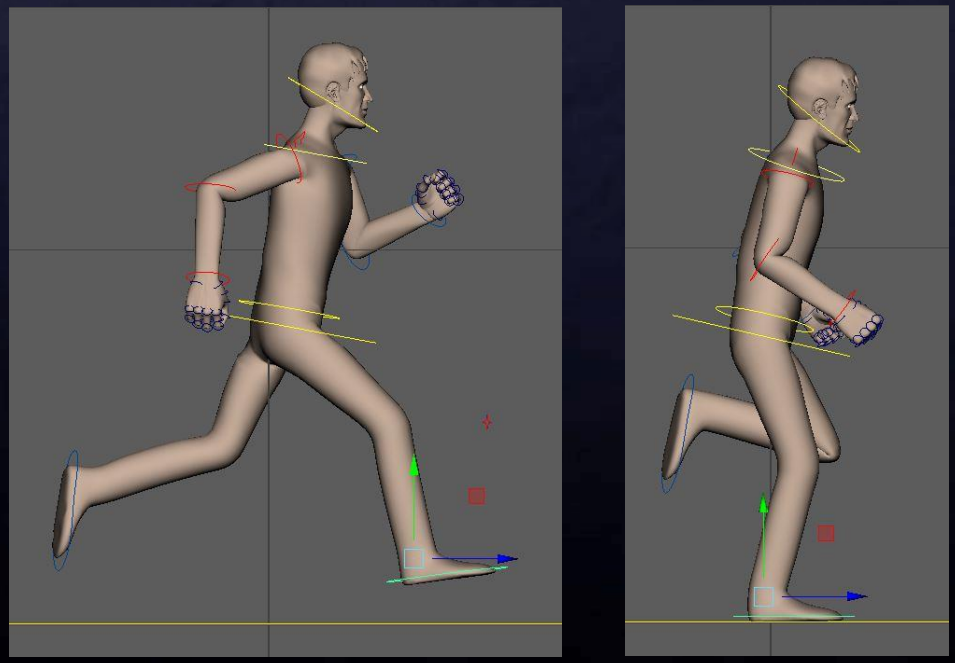


(a) (b)

(a) Extreme (Suspension position), (b) Breakdown (Passing position)

Animating a Run Cycle in place

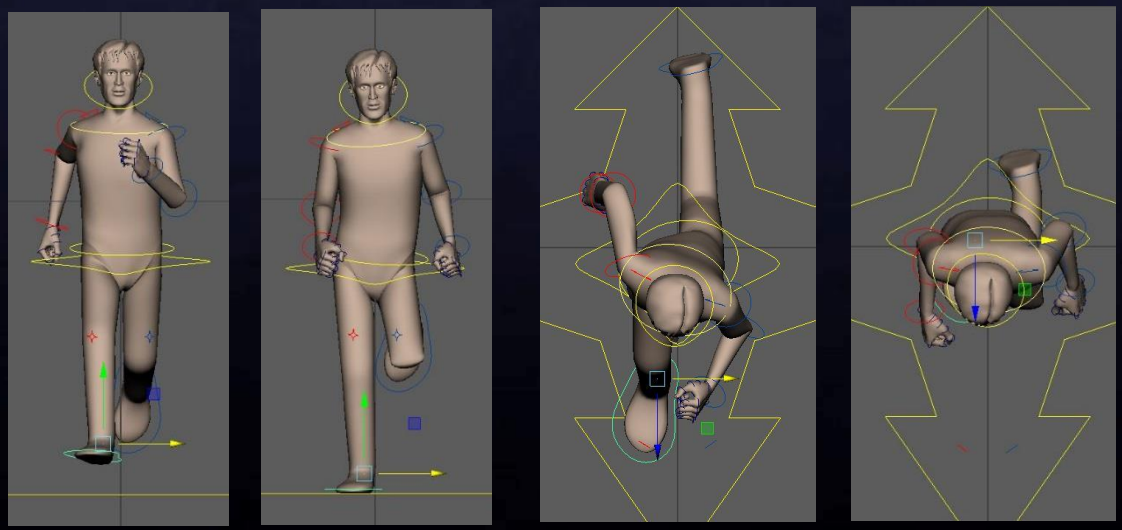
Upper body, working the movements up and down, as well as forwards and backwards



Animating a Run Cycle in place

Then the torso, working the weight distribution.

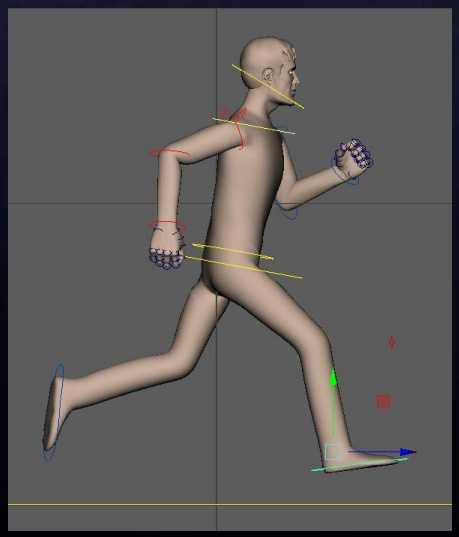
When running, a person goes from a *Contrapposto* pose (in the Breakdown) to a *Serpentine Line* pose (in the Extreme/Suspension position)



Animating a Run Cycle in place

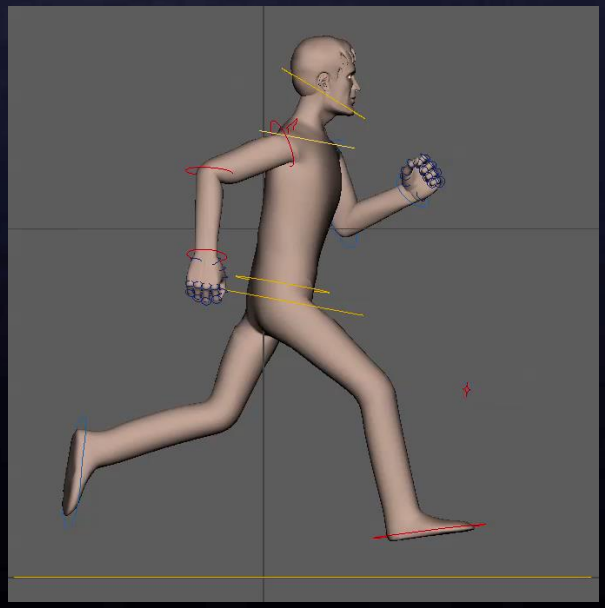
Then the head, applying the *Follow through* principle.

And finally the arms and hands (make sure you consider the *Arcs* principle)



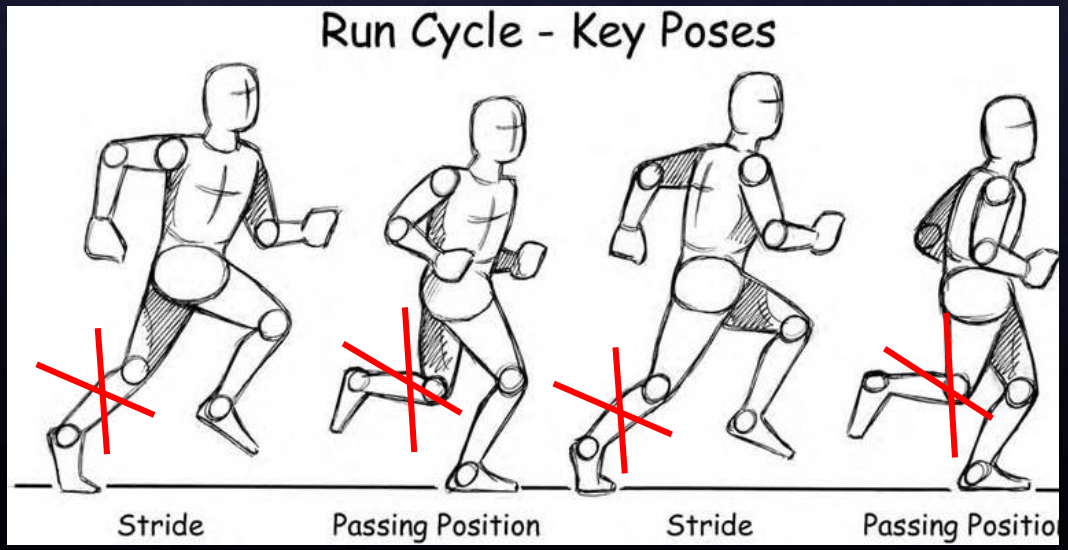
Animating a Run Cycle in place

The next step is to work the *Timing* and *rhythm* of the motion of each body part, using the Graph Editor (video).



Animating a Run Cycle

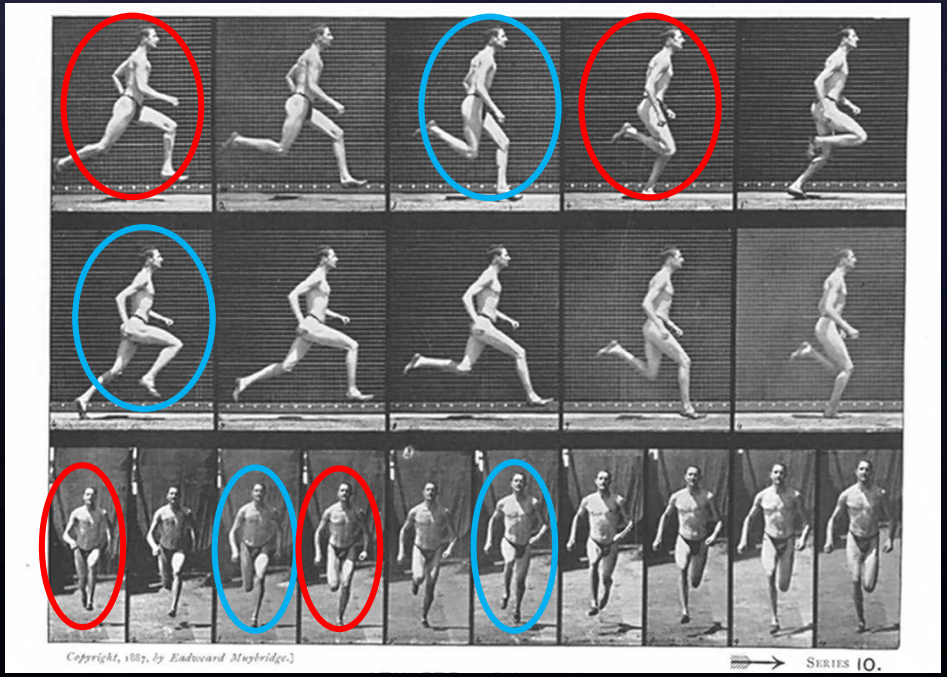
Again, define the main poses carefully. For example, the poses below are not exactly the correct ones,



Example from Webster (2005, p. 86)

Animating a Run Cycle

as you can see in the images from Muybridge…



Extreme pose (a), major Breakdown (b) and secondary Breakdowns (c,d)

Next step

Practice animating a run cycle

Questions?