From Stage to Screen:

How to Get the Most From Your Performance Capture

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Tuesday, 9 April, 13

Points:

PERFORMANCE CAPTURE...
- If we’re to believe the way the media portrays it, signals the end of the animator
- Unfortunately, many do believe
- More attractive PR Hero Culture vs Army of Animators

Performance Capture.
If we’re to believe all of the media, you would think it’s the end of the animator as we know it.

Unfortunately, many do believe this. With our hero-worshipping star culture, it just makes for more attractive PR to promote the performance of a singular actor rather than the army of people required to bring the character to life.

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Points:
- Avatar, James Cameron
- Unfiltered Actor Performances

For Avatar, James Cameron spent considerable time talking to the press about how his actor’s performances were directly represented on screen, unfiltered and without augmentation.

- Aaron Gilman
- Aldo Gagliardi
- Alex Burt
- Alexander K. Lee
- Alvise Avati
- Ambre Maurin
- Andrea Castagnoli
- Andrew Calder
- Andrew Doucette
- Andrew R. Jones
- Andrew Silke
- Andy Wong
- Anthony McIndoe
- Audrey Geoffroy
- Austin Eddy
- Ben Forster
- Ben Sanders
- Brad Lincoln
- Bradley McLaughlin
- Brett Purmal
- Chris Starwalt
- Daniel Barrett
- Daniel Zettl
- Danny Testani
- Daphnée Hong
- Dave Preciado
- David Clayton
- David Yabu
- Dennis Yoo
- Don De Castro
- Elwaleed Suliman
- Eric Reynolds
- Erik Morgansen
- Gerald Clevy
- Graham Binding
- Greg Lewis
- Greg Towner
- Hope Omen Ferdowsi
- Jalil Sadool
- James Bennett
- Jan Philip Cramer
- Jance Rubinchik
- Jason Snyman
- Jean-Denis Haas
- Jee Young Park
- Jeremy Cantor
- Jeremy Hollobon
- John Kubasco
- John Sore
- John Zdankiewicz
- Jonathan Paquin
- Jonathan Symmonds
- Josef Sy
- Kevin Estey
- Kevin O'Sullivan
- Kevin Wang
- Laurent Laban
- Leonardo Martinez
- Liam Russell
- Lina Kouznetsova
- Lindsay Thompson
- Marc Aubry
- Marchand Jooste
- Mark Stanger
- Matthew Riordan
- Matthias Bjarnason
- Merlin Lepper
- Michael Aerni
- Michael Cozens
- Miguel A. Fuertes
- Mike Stevens
- Mike VaVerka
- Mike VaVerka
- Morgan Loomis
- Neil Glasbey
- Nick Craven
- Oliver Exmundo
- Orlando Meunier
- Patrick Kalyn
- Paul Claessens
- Paul Kavanagh
- Paul Story
- Peter Chen
- Richard Baneham
- Richard Dexter
- Robert McIntosh
- Robyn Luckham
- Samy Fecih
- Scott Dace
- Shahar Levavi
- Simeon Duncombe
- Steve Guevara
- Steve Rawlins
- Taisuke Tanimura
- Thomas Shin
- Tim Stevenson
- Tim Waddy
- Toby Haruno
- Todd Labonte
- Tom Del Campo
- Victor Huang

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Points:
- 100+ Animators on IMDB
- Doesn’t even include face & body motion editors
- Double of Toy Story 3
- Disdain for mocap, taking ownership away

If this was the case, then these 100+ animators credited on IMDB must have been pretty bored during production. This list doesn’t even include all of the facial and body motion editors. For comparison, that is almost double the size of the animation team credited on Toy Story 3.

There is a lot of disdain for mocap in the animation industry. Many feel that it is taking ownership of the movement out of their hands.

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Points:
- Ratatouille credits
- Undermining/Cheapening our craft
- Not without cause
- Unappealing, plat performances for long time

Evidence like this title at the end of Ratatouille show how many feel like it's undermining or cheapening our craft.

This isn't without cause. It has been used to create unappealing, flat performances for a very long time.

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Points:
- could be seen as far back as the 30’s
- Early Snow White Example
- First “Mocap”, Rotoscoping
- Other TV shows and Films used it (Fire and Ice)
- Had “Realism” lacked appeal, seemed to float

…an early example could be seen in the film Snow White from the late 30’s where they used the first iteration of motion capture, “Rotoscoping”. Many other traditionally animated films and TV shows used this technique as well. It always provided a look of “realism” but lacked appeal and almost appeared to float on screen.

Points:
- CGI not different
- FF: Spirits within first to use mocap
- Polar Express and Beowolf followed
- While Novel, felt “Flat”
- We have been observing humans our whole lives, we are experts
    - know when something is “off”, even when can’t communicate it
- “uncanny valley” has become common vocabulary
- Animator’s job, whether mocap or keyframe, to make performance “Believable”.
- Believable vs Realistic, lost it’s value

In CGI, the results aren’t that much different. The first big feature film release using primarily mocap was Final Fantasy: The Spirits Within. This, along with other notables like Polar Express and Beowolf showed that, while novel, straight mocap performances were ultimately flat and felt “off” to audiences. This is because we have been observing things move our entire lives, especially other humans. We’re all experts in observing human movement. When something is a little off, even though we might not be able to communicate what it is, we feel it. The term “uncanny valley” has become a commonplace term to describe this.

The job of the animator, regardless of whether they are working with mocap or keying it by hand, is creating believable performances. I deliberately say “believable” and not “realistic” for a reason. We throw the terms realism and photo-real around so much that I feel its currency has lost it’s value.

Points:
- Current AAA games have Env, Lights, Dynamics close
- Characters lack grounding, motivation, or conviction (getting better all the time)
- Films realized it’s not about cloth sims or SS Scattering, it’s about believable performances
- do we, the users, believe in the characters and their situations?

Take a still frame from any current AAA game that tries to mimic reality in terms of characters, environments, lighting, or dynamics and they’re quite impressive and close to the mark.

But, when you look objectively at the characters moving and interacting in their environments, it becomes very difficult to believe that they are grounded in those situations, have those motivations for their actions, or have conviction in their choices. We’re getting better all the time, but we still have a lot of room for improvement.

Many animated films realized long ago that creating amazing characters, performances, and stories wasn’t about how many cloth sims they can run at any given time or how sweet their sub-surface scattering is. It’s about believability and appeal. Do you, as an audience (or user), believe what you are seeing. This goes for the characters, their environments, and their stories.

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Points:
- These characters aren’t realistic, but we believed them. Forgot they were pixels.
- Believability is the goal
- Getting there quickly with less work, everyone’s best interest
- Performance capture is something to leverage
    - large amounts of complex movement quickly
- Animators are ultimately responsible for the final performance, regardless of origin

Look at these characters, in no way are they “realistic” in the traditional sense that games throw around. And yet we all believed in them and their stories. They made people feel real emotions and for a couple of hours, we forgot that they were just pixels.

Believability should be our goal and using whatever we can to get us there quickly with the least amount of work is in everyone’s best interest. Performance capture is something we can leverage to do just that. It isn’t the ends though, it’s the means. It’s a way for us to get large amounts of complex, believable movement in our games much faster than the time it would take to create it by hand. Animators should and will always have a hand in crafting the performance, regardless of it’s origins.

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Mocap is a TOOL

Points:
- I would like to change the perception of mocap
  - not a product, but a tool
- More specifically...

But, I would like us to stop thinking of it as a product to just be cut up and thrown into the project, but rather a tool for animators to use.

More specifically...

Mocap is a

TOOL

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Points:
- a PRODUCTIVITY tool
- Change mindset, take ownership, active role in achieving in achieving believable
- most games use bipeds, thousands of animations
- lots of changes, need to be agile
- finding a way to get the most out of performance capture is key

...a productivity tool.

Changing our mindset towards it being a tool versus a product, and taking ownership over that tool, allows us to take an active role in achieving believability in our games.

The majority of games being made today employ bipedal, or two-legged, characters and require hundreds, often thousands of animations to complete.

Constantly evolving gameplay requirements, script and story changes, and often strict release deadlines dictate that animators must be as productive and agile as possible.

Finding a way to embrace and squeeze the most out of our performance capture is how we achieve this.

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Points:
- Like anything in game dev, Preparation is key (just like production)
- Without pre-pro, final quality suffers. This applies to mocap too
- important to work effeciently
- if making big changes at shoot, not prepared enough
- At EA, captured upwards of 200 A-takes/Day (one every two minutes)

As with every aspect of game development, preparation is crucial to quality of the final product. Without a thorough pre-production, a game is likely to struggle during production and the quality will be much less than it could have been. The same applies to a mocap shoot.

Add that to the fact that you're paying day rates for many of the services at a mocap facility, it is important to work as efficiently as possible on the shoot day to get as much quality content as you can. If you find yourself often making big design, story, or content changes on the floor, you haven't prepared enough.

When I was at EA, it was not uncommon during a gameplay shoot for us to get upwards of 200 moves in a day of shooting. That's an average of one A-take every two minutes.

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Points:
- On Hitman, shot OVER feature length in 10 days, cast of over 15
- Many shot twice, due to schedules
- Intro to talk: walk through process, common mistakes (ones I've made too), look at data
- Introduce myself

On Hitman: Absolution, we shot well over a feature length film's worth of cinematics in 10 days with a cast of over 15 actors. Many key scenes even needing to be shot twice as, due to scheduling conflicts, we couldn't have all of the actors for a scene on set at the same time.

I'll walk you through my process from planning to shooting and discuss some of the common mistakes I see a lot of teams make. After, we'll look at how to approach working with the data you get back, running through an example of how you can use mocap to achieve a more stylized movement quickly and easily.

First, let me give you a brief introduction...

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Points:
- Name, 12 years experience
- Originally from Vancouver
- EA for 9 years
- Moved to CPH in 2009 to head up Hitman
- All that time, worked with mocap
- Worked with and learned from some of the best in the industry
- goal for talk: pass along what I've learned, improve your pipelines and data
- going to go through in a chronological order...

My name is Simon Unger and I have been animating for games for about 12 years now.

Originally from Vancouver, BC, I spent almost nine years at Electronic Arts working on numerous sports titles, mainly focusing on cinematics, until late 2009 when I moved to Copenhagen, Denmark to be the animation lead for Hitman: Absolution.

In all of that time, I have been working with and around motion capture. Spending more time on either side of the cameras than I can remember, I have been very fortunate to have worked with some of the best in the industry as well as having directed a broad spectrum of talent ranging from an NBA cheerleading squad to an academy award winning actor to a junior programmer.

My goal today is to pass along some of what I have learned in that time and I hope that some of you will find the information useful and improve your own mocap pipelines and workflows to get more, higher quality performances.

I'm going to go through the process in a sort of chronological order. Some of this you might already do, some of it you might not.

So, let's get started...

Preparing For The Shoot...

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Points:
- Internal or external, pays to make the crew's lives as easy as possible
    - they'll be your pit crew for the shoot.
    - avoid unnecessary work that could be avoided
- top point from several vendors: assign POC first
- Streamline communication early

Regardless of whether you are using an external vendor or your own internal studio, it pays to make the lives of the people involved with the shoot as easy and straight forward as possible. They will be your pit crew for the shoot and anything you can do to free their time from tasks that could have been avoided, will mean more time to help you capture more and better data.

When I spoke to several mocap vendors, a very common complaint was that teams don't assign a consistent point of contact on the team who is the conduit through which all communication happens. Too often it ends up being a game of hot potato within the team of who handles what. First thing first, assign an owner. That person can disseminate info to the rest of the team and also act as the conduit back to the mocap vendor. Streamline your communication early.

Preparing For The Shoot...

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Points:
- get moves into spreadsheet format is next
- tracking in excel anyways
- use vendor’s format if they have one
- easy to export to hansoft, devtrack...

Getting your moves into some kind of spreadsheet-like format should be the next order of business.

I like to track animations for a project in excel anyways, so this makes creating a shotlist as easy as copying and pasting. You can use whatever you’d like, just make sure it is easy to update and maintain.

If the mocap studio you are using has their own format they would like you to stick to, definitely deliver it to them using that. Otherwise, Excel or Word make for easy editing and exporting to various other common production tools like Hansoft or Devtrack.

Preparing For The Shoot...

Creating a Shotlist

Tuesday, 9 April, 13

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Preparing For The Shoot... Creating a Shotlist

Points:
- At a minimum, should contain: names, description, actors, props/sets, duration, priority
- if you can’t have that, not ready to shoot
- if you do, off to a good start

At a bare minimum, it should contain:

- Move/shot names (the actual file name you want delivered)
- Shot description (be as detailed as you can. This section should also include script dialogue and direction notes)
- Number of actors in the shot (and names)
- Props needed (if applicable) with dimensions and links to 3D files
- Sets needed (if applicable) with dimensions and links to 3D files
- Estimated duration of the shot (The mocap cleanup crew needs to be able to anticipate the amount of work they will have to do)
- Priority (scale of one to five is fine, this will dictate what data gets delivered in what order)

If you can’t assemble that basic information as a start, then I would argue that you’re not ready to head to the mocap studio yet. If you have a comprehensive list of the moves you need and can supply this information for each of them, you are off to a good start.

Preparing For The Shoot... Creating a Shotlist

* Move/Shot Names
* Shot Description
* Number of Actors
* Props Needed
* Sets Needed
* Estimated Duration
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Creating a Shotlist

* Move/Shot Names
* Shot Description
* Number of Actors
* Props Needed
* Sets Needed
* Estimated Duration
* Priority

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Points:
- additional info: Enter/Exit states, phases, distance covered, angles

Additional Information that is handy to have on the shoot day is...

- What moves or states the shot will be coming from and going to
- Start and end phase, if needed
- distance covered, or meters per second
- start and end direction

Preparing For The Shoot...

Creating a Shotlist

* Move/Shot Names
* Shot Description
* Number of Actors
* Props Needed
* Sets Needed
* Estimated Duration
* Priority
* Enter/Exit States
* Enter/Exit Phase
* Distance (MPS)
* Start/End Direction

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Points:
- additional info: Enter/Exit states, phases, distance covered, angles

Additional Information that is handy to have on the shoot day is...

- What moves or states the shot will be coming from and going to
- Start and end phase, if needed
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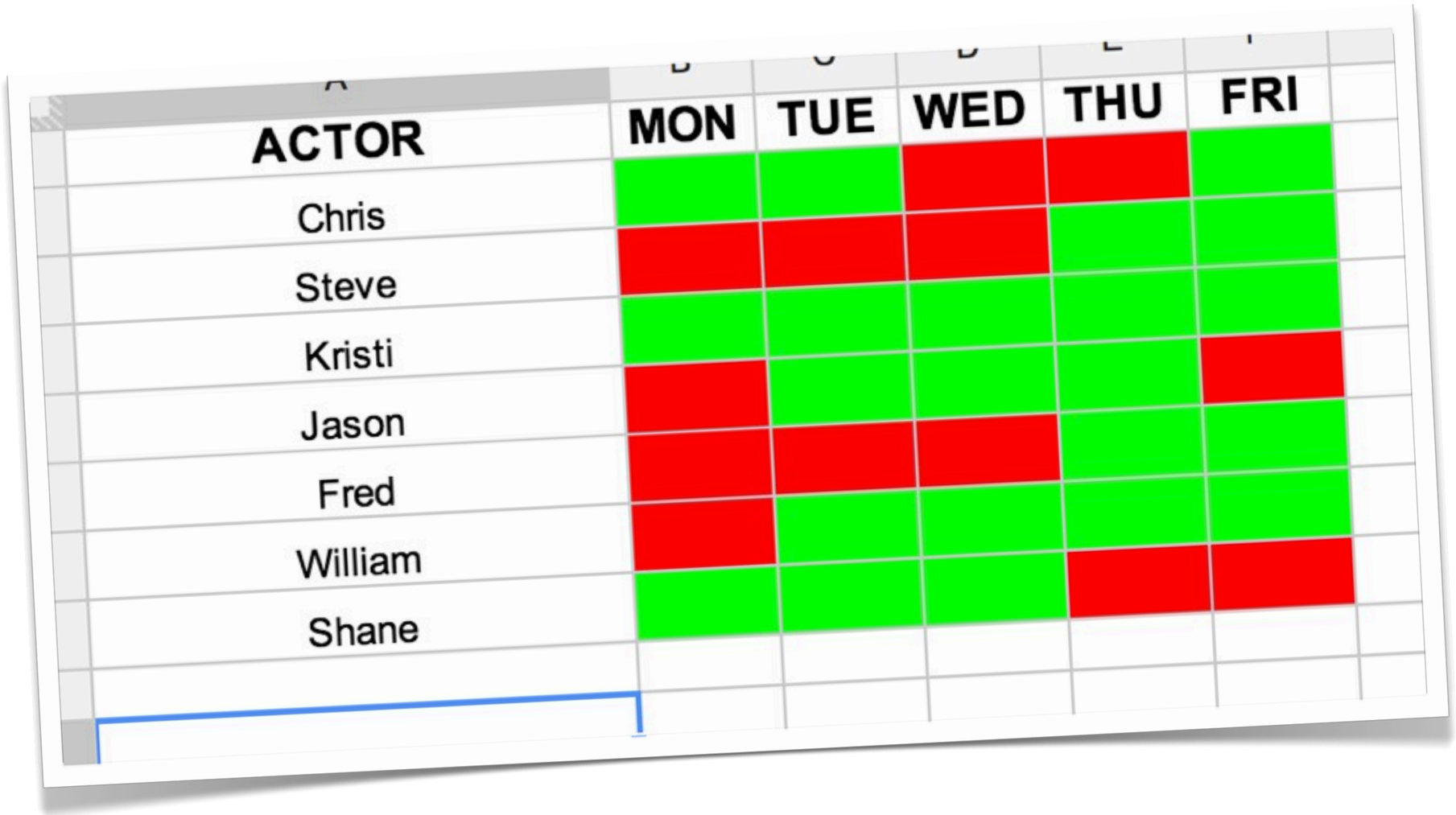
Preparing For The Shoot...

Breaking Down a Script

Points:
- breaking down game mechanic easier than script
- if lucky, most are 2-3 ppl, short in dialogue and location
- don’t require much logistical planning

Breaking down a game mechanic into these moves is a much more modular exercise than breaking a script into shots. If you’re lucky, most of your shots are 2-3 people max and short in dialogue and camera and location changes. Those can often be done in one take and don’t require a lot of logistical planning.

Preparing For The Shoot… Breaking Down a Script



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Points:
- challenge is in longer, multiple actor, dialogue heavy scenes with conflicting schedules
- get availability into something visual to help work through it

Where it gets tricky is when you have longer, dialogue heavy scenes with multiple actors who, sometimes, cannot even be on set together on the same day. Accounting for multiple takes and stand-in's is critical as well as juggling the schedule for multi-day shoots.

Getting your actor's availability in a spreadsheet format and comparing it with a similar breakdown of actor to scene assignment helps think this process through greatly.

Preparing For The Shoot...

Multi-Person Shots

Points:
- Planning for this is often one of trickiest parts of a shoot
- IF EVERYONE ON SET, breaking up shots at camera cuts, location changes for starters
- where storyboards are invaluable
- try to shoot heads and tails to make assembly later easier

Planning for these multi-person shots can often be one of the trickiest planning tasks for a shoot. If you can have all of your actors on set the same day, then it’s more a task of breaking up longer, more complicated shots into logical break points. Camera cuts or location changes are obvious ones. This is where storyboards can come in handy.

Also, always try to shoot some heads and tails for these break points to give you some wiggle room when you stitch it together afterwards.

Preparing For The Shoot... Multi-Person Shots

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Points:
- can’t have all actors present? need to shoot b-sides (or c, d, e...)
- where utility actors come in
- especially for heavy interaction
- CAN use someone from team, make sure they are comfy in role
- mark places, take b-roll and audio, refer back to it
- end goal is SEAMLESS ASSEMBLY at studio

If, on the other hand, you can’t have all of your talent on set at the same time, you will need to shoot a b-side (or even a c, d, and e-side) to every take. If you have the budget, this is where utility actors comes in handy for standing in for each role. If you have to shoot a and b takes for a shot that involves heavy character interaction, then you will NEED a utility actor and keep his or her data for one of the takes. In a pinch, use someone from your team. Just make sure it’s someone comfortable performing in the role or it will be extremely obvious in the final data.

Additionally, mark actor places on the set, take photos or video, and refer back to all of it when you shoot the b-side. Recording audio on set helps here as well. You can play back the a-take while shooting the b-take to make sure the timing matches.

The end goal is having all of your separate takes layer on top of each other with the interactions, dialogue, and timing needing as little correction as possible. Every scene is different, so there’s no set rule on how to break them up, but do your best to break down the scenes into the best modular parts that work with your schedule.

*****NEED MORE HERE?*****

Preparing For The Shoot...

Naming Conventions

Points:
- good time to briefly mention naming conventions
- largest to smallest denominator
- easy to sort in editor or explorer
- important when asset count high
- for gameplay...

This would also be a good time to mention that making sure your naming conventions can support multiple takes within the same shot is a good idea.

My general format for naming conventions is to go from the largest common grouping to the smallest from left to right. This way when you sort a lot of files alphabetically, like in your editor or file browser, they automatically group into a manageable order. This becomes really important when your asset count gets into the thousands. For example, for gameplay, it might be something like:

Preparing For The Shoot... Naming Conventions

Points:
- CharacterType_MoveState_SubState_MoveName_VariationNumber
- in practice, would look like...

CharacterType_MoveState_SubState_MoveName_VariationNumber which would look something like:

Preparing For The Shoot... Naming Conventions

CharacterType_MoveState_SubState_MoveName_VariationNumber

Points:
- CharacterType_MoveState_SubState_MoveName_VariationNumber
- in practice, would look like...

CharacterType_MoveState_SubState_MoveName_VariationNumber which would look something like:

Preparing For The Shoot... Naming Conventions

MaleRegular_Locomotion_Turns_Run180Left_01

Points:
- MaleRegular_Locomotion_Turns_Run180Left_01
- left long, abbreviated would be...

MaleRegular_Locomotion_Turns_Run180Left_01

I have left it in its long form for clarity’s sake, but normally it would be abbreviated to look more like:

Preparing For The Shoot... Naming Conventions

MR_Loco_Turn_Run180L_01

Points:
- MR_Loco_Turn_Run180L_01
- Cinematics trickier, multiple places they’re coming from (script, intros, deaths, branches)
- same rules apply, but add a variable to make later changes easier
- looks like...

MR_Loco_Turn_Run180L_01

Cinematics are a little trickier, because you usually have a couple of different places they could be coming from. Scenes from the script, Level Intros, Death scenes, Decision tree branches. The same basic rule applies, start with the largest common denominator and work down from there. What I have found helpful in the past to account for multiple takes and scene additions or changes later on is to add a kind of alpha-numeric variable to give me some wiggle room. It looks something like:

Preparing For The Shoot... Naming Conventions

LevelNumber_SceneNumber_AA_Description_VariationNumber_CharacterName

Points:
- LevelNumber_SceneNumber_AA_Description_VariationNumber_CharacterName
- AA is variable way to add changes later, also signal which take
- first is shot, second take
- in practice, would look like...

LevelNumber_SceneNumber_AA_Description_VariationNumber_CharacterName

The AA is a way to add later changes and signify which take the file is. The first A is the shot, the second the take. In practice, this would look like:

Preparing For The Shoot... Naming Conventions

L004_043_AA_DaveEatsLunch_01_Dave
L004_043_AA_DaveEatsLunch_01_Gary
L004_043_AA_DaveEatsLunch_01_Steve
L004_043_AB_DaveEatsLunch_01_Bruce
L004_043_AB_DaveEatsLunch_01_Tim
L004_044_AA_DavesSandwichTurnsIntoAnAlien_01_Bruce
L004_044_AB_DavesSandwichTurnsIntoAnAlien_01_Gary
L004_044_AB_DavesSandwichTurnsIntoAnAlien_01_Steve

Points:
- scene with Hero, Dave, eating lunch with friends Gary, Steve, Bruce, and Tim
- Sandwich turns into an alien
- Dave, Gary, and Steve can’t be on set the same day as Bruce and Tim (who will be on b-side)
- Later add scene where Dave reacts violently to the bite of the sandwich...

So say our original script had our hero Dave in a diner eating lunch with his friends Gary, Steve, Bruce, and Tim when suddenly his sandwich turns into an alien. The actors playing Dave, Gary, and Steve couldn’t be on set the same day as the ones playing Bruce and Tim. Bruce and Tim will shoot the b-sides of these scenes and we will assemble them all back together at the studio.

BUT, after you see the shots in the game, you realize you could get a better gag in there if Dave reacts violently to the bite he just took of the sandwich moments before it turns into an alien.

Preparing For The Shoot... Naming Conventions

L004_043_AA_DaveEatsLunch_01_Dave
L004_043_AA_DaveEatsLunch_01_Gary
L004_043_AA_DaveEatsLunch_01_Steve
L004_043_AB_DaveEatsLunch_01_Bruce
L004_043_AB_DaveEatsLunch_01_Tim
L004_043_BA_DaveGetsSick_01_Dave
L004_043_BB_DaveGetsSick_01_Tim
L004_044_AA_DavesSandwichTurnsIntoAnAlien_01_Bruce
L004_044_AB_DavesSandwichTurnsIntoAnAlien_01_Gary
L004_044_AB_DavesSandwichTurnsIntoAnAlien_01_Steve

Tuesday, 9 April, 13

Points:
- can’t call it #44, already taken
- added to previous shot, #43, and called #43B
- again, visual format helps get overview
- again, storyboards also useful in breaking down

You can’t call it shot #44 as that’s already taken so we can add it to the previous shot, #43 and call it 43B.

Again, putting all of this into a spreadsheet structure will help you think this process through and see how it all fits together.

This is also where storyboards can help visualize what your requirements will be…

Preparing For The Shoot...

Storyboards/Animatics

Points:
- too many teams don’t spend enough time in previz, huge mistake
- even just thumbnailing out shot will save time later on

WAY too many teams don’t go through the pre-viz process and I feel it’s a huge mistake.

Even just the act of thumb-nailing out a shot will save you a ton of time later on.

Preparing For The Shoot... Storyboards/Animatics

Points:
- ideally have animatic for EVERY shot
- helps to have VO vs subtitles for timing
- good on set for actors so they know the camera placement and framing
    - can constrain or exaggerate performance when needed
    - without can be difficult to do good wide or tight shots later, evident in many current cinematics
- important for gameplay moves as well
    - collect reference footage
    - edit tightly, name properly to make easier to fine
    - save time looking for “some video” on youtube
- goal is to have as much forethought as possible
    - talent will feed off of this
    - may be left giving what they THINK you want, won’t get what you NEED

Ideally, you will have an animatic for each shot which shows staging, camera direction, and which actors are in each shot. It also helps to do some placeholder voice over on them to help define the pacing and overall length of each shot, which you need for the shotlist. Putting the dialogue as text on the screen doesn’t work well as it takes longer to read than speak and the timing of the shot will usually be off.

Animatics are also really useful on set to show the actors before shooting. They will have a much clearer vision of the purpose of the scene and know where to push or restrain their performances. This also gives them an idea of where the camera placement is and how tight the shot is. Too often this isn’t thought out well enough and we have a hard time doing good close-ups or wide shots later because the actor moves too much or too little in frame. You can see evidence of this in many game cinematics.

For gameplay moves, try to collect some reference footage for what you’re trying to capture. Edit it tightly and organize them with the same naming convention as the final move. This will save you a ton of time scrolling through random videos or even searching YouTube for “That fight scene you saw that one time...”.

The goal is to apply as much forethought and be as specific and as possible to what it is you want to capture. Whether working with actors or athletes, the talent will feed off of this and dial their performances to reflect it. If you aren’t sure what you want, they will be left delivering what they THINK you want and that might not always be what you NEED.

Preparing For The Shoot... Storyboards/Animatics

Tuesday, 9 April, 13

Points:
- ideally have animatic for EVERY shot
- helps to have VO vs subtitles for timing
- good on set for actors so they know the camera placement and framing
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Preparing For The Shoot...

Points:
THE DIRECTOR...
- many teams feel they can get by using someone from their team, no matter the experience.
- every vendor spoken to cites this in the top mistakes made

A lot of teams I speak to feel that they can get by using someone from their team to direct a shoot, no matter how inexperienced.

Pretty much every mocap vendor I have spoken to has cited this as one of the top mistakes they see teams make.

Preparing For The Shoot...

The Director

Tuesday, 9 April, 13

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Preparing For The Shoot... The Director

Tuesday, 9 April, 13

Points:
- formula 1 team wouldn't put an accountant in the drivers seat, why would you?
- until recently, quality of movement wasn't called out in game reviews, making it less of a priority
- most other visual hurdles making great strides, animation hasn't kept up (for the most part)
- now in the spotlight
- Ubisoft making big push
- more emphasis on story and empathy with characters (look at the amount of narrative and story talks at GDC alone)
- great for animators, bad for teams with most experience in tech and game design

A Formula 1 team wouldn't put one of their accountants to the drivers seat, so why would you?

Up until only the last few years, the quality of the movement and acting wasn't usually called out in game reviews and therefore, usually down-prioritized when planning and executing a project. With most of our other visual hurdles making so many great strides on this recent generation of hardware (dynamics, lighting, model and texture fidelity), animation, for the most part, hasn't kept up and is now being thrust into the spotlight. Companies like Ubisoft have made it a major priority going forward for their biggest titles.

There is also increasingly more emphasis on story and empathy with the characters, which is awesome for us animators, but difficult for teams who have spent so many years with their heads down in game theory and technical hurdles.

Preparing For The Shoot... The Director

Tuesday, 9 April, 13

Points:
- most on team have no background in live performance
- not that you shouldn't use teammate, but check egos and make sure it's the BEST person
    - if not confident, bring in a professional driver
- better to have the director on the team for the duration of the project to maintain vision and direction
- several places to find one
    - talk to mocap studio, VO vendor
    - VO directors have considerable experience
    - when teamed with animator, draws out the best performance
    - added benefit of giving animator experience and mentor
- if reticent to spend money on director, consider backend costs of poor capture and redos

Most on the team, including writers, have no real background in live performance and as such, don't have the specific skills needed to get the most out of an actor.

I'm not saying that you should never use someone from the team to direct, only that you should put away your egos and make sure that this person is the one to extract the best performance out of your talent on set. If you aren't 100% confident about that, then you need to bring in a professional driver.

Even better is to have this person on the team for the duration of the project to bring the vision and direction established before and during the shoot is seen through to the final product.

There are several places you can find one. If you're using an external mocap studio, start with them. There's a good chance they have someone they can highly recommend. Alternatively, talk to your casting or VO agent. VO directors have considerable experience directing live performances and teamed with an experienced animator, should be able to draw the best out of your talent. This has the added benefit of giving your animators a mentor and the experience in directing live action, which will also pay itself off in the future.

If you or your team is reticent to spend the extra money on more headcount, consider the backend cost of modifying poor performances or worse, reshooting when what you get back isn't as awesome as you thought it was. In the quest for believability, having a capable director is one of the most important moves you can make.

Preparing For The Shoot...

Combat/Stunts

Points:
COMBAT AND STUNTS...
- depending on complexity, probably good idea to bring in help on this too
- sometimes can be talent as well
- start with mocap vendor or casting agent
- if you can’t, more prep work on your end

Depending on the complexity of the performance you are looking to capture, it’s probably a good idea to bring in help on this as well. Often, the mocap talent and choreographer can be the same person, which eliminates hiring extra people. This does require taking a little more time before the shoot as well as in between each shot to review and iterate on the movement. This was the case for us on Hitman.

Again, talking to your mocap vendor or casting agent are the best places to start looking for someone.

If there’s no chance you’re going to get help in, you have a little extra work to do.

Preparing For The Shoot...

Combat/Stunts

Tuesday, 9 April, 13

Points:
- if shooting without a choreographer, define fight style ahead of time
  - Krav Maga, Kapour, and Kali are popular styles seen in many films
- gather reference and edit, make storyboards
- goal is a blueprint for each move and all branches for mechanic
- define durations as much as possible
- work and rehearse with designer as much as possible
- clearer you are, more time you'll save
- figuring this out on the shoot floor wastes everyone's time
- same for stunts, just telling actor to "jump over box" or "act like you're getting shot" isn't enough
- be as specific as possible, easier for talent

If you're shooting combat without a choreographer, you're going to have to define your character's fight style on your own. Krav Maga, Kapour, Kali are popular stand up fight styles seen in a lot of movies these days. Gather as much reference as possible from film, TV, MMA, whatever and start editing or storyboarding out your moves using the reference. Your goal is to have a blueprint for each move and all the branches in your fight mechanic. It's also really important to define duration of the moves at this stage. Make sure to work and rehearse with your designer to nail the timing down. The closer you can get to the final timing at the shoot, and the clearer the style target you have, the more time you'll save in post editing the movement. If you're trying to figure out how the move is going to go on the shoot floor, you're wasting everyone's time.

Stunts are very much the same. Reference is super important here. Just telling your actor to jump over a box or "Act like your getting shot" isn't good enough. Being as specific as possible is going to make it easier for the talent to give you what you want, which ultimately will get you the best data possible.

Preparing For The Shoot...

Casting

Tuesday, 9 April, 13

Points:
CASTING...
- casting is huge challenge
- different legal hurdles in different parts of world
- if no in-house help familiar with contracts, guild rules, casting calls...bring in help
- many unfamiliar with rules and regulations for work in video games, make sure they are
- even using internal staff as talent can bring up legal issues.
- do it right from the start
- talk to mocap vendor first, usually have plenty of experience and can refer if not
- also speak to VO vendor
- both usually already have standard contracts in place
- have had great success with VO talent as mocap talent, don’t rule it out
- how to choose talent?
    - every project and character has different requirements, but a couple generals I look for are...

Casting can easily become a massive challenge for a shoot. Depending on where in the world you are, the legal details are different and that will need to be sorted out. If you don’t have in-house help that is familiar with the ins and outs of talent contracts, acting guild rules and regulations, casting calls and the like, I would strongly suggest using an external vendor. Many are unfamiliar with the different rules and regulations regarding work on video games, so make sure they know what they’re doing.

Even if you decide to use internal staff as talent, you can run the risk of legal issues. Do it right from the start and you will thank yourself later.

As before, speak with your mocap vendor first. They can usually recommend talent as well as organize and hold casting calls for you. You could also talk to your VO vendor, as they are often familiar with the details surrounding video game talent work. Both usually have pre-made talent contracts and are used to negotiating with agencies in this regard. I have had great success using VO talent in performance capture roles, so don’t rule them out either.

This is also where having an experienced director on board can help. They often have existing relationships with agencies, have organized and conducted casting calls, and can help guide you through the process of choosing your talent.

So, how do you pick your talent?

Every project and character has different requirements for the talent on a shoot, but there are a couple of general attributes I look for when casting most talent.

Preparing For The Shoot...

Casting

Points:
- neutrality
- watch how they walk, stand, perform basic actions
- many ppl have subtle asymmetries and affectations
- some actors have go to gestures that will be very noticeable on multiple NPC’s
- bad for generic moves, GREAT for main characters
    - limps, handedness, quirky affectations not seen enough in games

The first thing I look for when auditioning and casting general purpose talent (talent that will be used for locomotion, NPC generic stuff, utility actor roles for cinematics, etc) is neutrality. Pay close attention to how they stand, walk, and perform basic actions like sitting, standing, going from a stand to a run, etc.

Many people have subtle asymmetries and affectations that will flavor their movement and acting slightly and you don’t necessarily want this as your baseline in your game. Some actors also have “go to” gestures they use a lot and can become really noticeable when 10 different NPC’s in your game all have the same head wobble when they get angry.

That said, if you are casting for character specific roles, then this stuff is fantastic and not something we see enough in games. Limps, handedness, quirky affectations are all great character builders.

Preparing For The Shoot...

Casting

Tuesday, 9 April, 13

Points:
- next I look for how malleable they are, how well they take direction
- usually ultra specific direction like phase, duration, or even mimicking other characters or reference
- show reference footage and have them impersonate
- if shooting sports, show signature moves
- difficult to find perfection, but the closer they get, the more time saved later correcting

Next, I look for how malleable they are, or how well they take direction. There is bound to be some ultra specific direction regarding phase, duration, or even mimicking other characters during the shoot.

Try showing them reference footage of different characters and having them impersonate the physicality. If you're shooting sports or action movement, show them some different athletes who have very a very signature move style and have them mimic it. This will give you a good idea of their capacity to break down their mechanics, interpret the direction, and perform in the way you require. It's difficult to find someone who can go 100% all the time, but the closer they can get you to the desired result will save valuable time later in post.

Preparing For The Shoot... Casting

Points:
- working on sports, had to make loco system to support 100's of different athletes, but also include signature moves
    - Hideo Nomo's pitching or Lebron James' pre-game warm up for example
- got best results with college and university athletes
    - spent careers up to that point focused on perfect mechanics, little asymmetries like older pros
    - often big fans and can mimic pro's moves from memory
- consider approaching local schools and speaking to coaches
- for cinematics, have had good luck with local theatre groups and schools
    - people trained in theatre or dance tend to be more aware of silhouette and physical presence over film and TV

When I worked on sports games, we had to create a base loco system to cover hundreds of different athletes, but also pepper in signature moves for key athletes. Hideo Nomo's pitching style or Lebron James' pre-game warm up for example. For this, we got the best results from using college and university athletes. They have spent their entire careers up to that point studying the base mechanics of their sport and as a result, don't usually have any asymmetries that tend to develop in older, professional athletes. Also, they are often huge fans of the sport and have many of their favorite pros' moves already in memory and can get quite close to the real thing. Consider approaching local schools and speaking to the coaches as you could find some hidden gems for talent there.

For cinematics, I have had really good luck casting from local theatre groups and schools. I find people who were trained in theatre or dance tend to be much more aware of their silhouette and physical presence than film or tv trained ones.

Preparing For The Shoot...

Casting

Tuesday, 9 April, 13

Points:
- celebrities not much different, usually requires jumping through more hoops
- unless you or someone has great contacts and experience, you need some help with this as well.
    - agents/managers can be diificult
- have second (3rd, 4th) pick handy, as first choice often falls through
- not much cache around mocap acting work, difficult to get big names on board
    - agents don’t know how to pitch it
    - confusion regarding contracts
- not impossible, right person can help
- will pay more for likeness, so good way to stretch budget if they don’t need to be twins

Casting celebrities isn’t much different, but usually requires jumping through a few more hoops. Unless you or someone in your company has some great contacts and experience in this regard, get some help with this. Agents and managers are difficult to deal with at the best of times and very often schedules don’t align for you to get your first pick, so have a second, third, or even fourth choice as backup.

Currently there is still not much cache around mocap acting work for games and you will find it a bit of an uphill battle getting larger names on board. Agents often have no clue how to explain it to their clients and there still seems to be some confusion regarding which contracts to use. It’s not impossible, though. Getting the right experienced help in early will make this go as smoothly as possible.

Keep in mind you will pay more if you are using their likeness (or if the in-game character looks even remotely like the real life actor) so it’s a good way to stretch the casting budget if they don’t have to be twins.

Preparing For The Shoot...

Rehearsals

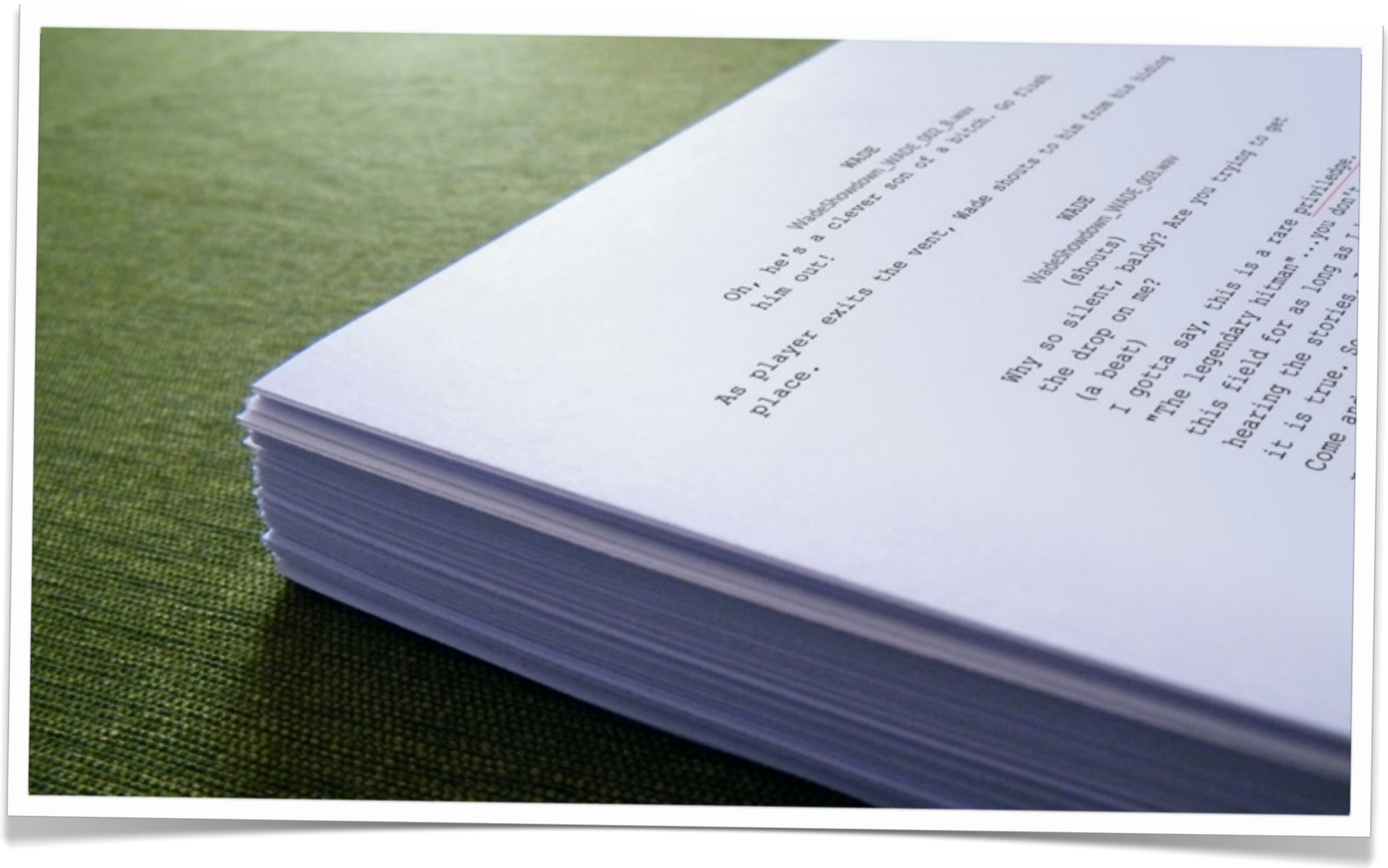
Tuesday, 9 April, 13

Points:
- when asked what were some common mistakes, not having rehearsals was in top three
- any other situation where actors perform have rehearsals, yet games don’t
- even 10-20% relative to shoot time will give a huge benefit

When I asked friends and acquaintances from different mocap studios what the costliest mistakes teams make when preparing for a shoot, not having rehearsals was always in the top three responses.

Films, TV shows, plays...any other situation where actors are expected to perform a role have rehearsals, and yet so few game teams do. Setting aside even just 10-20% of time relative to the length of your shoot to rehearse will get you enormous benefits when you’re on set.

Preparing For The Shoot... Rehearsals



Tuesday, 9 April, 13

Points:
- getting together to establish character traits and relationships is crucial
- review storyboards, character sheets, concepts...anything
- don’t want to be making big decisions on set
    - can lead to rushed decisions and a “good enough” attitude when calling takes
- takes many iterations to get a scene dialed
- rare occasions when amazing performances happen without rehearsals, but not something you can count on
    - the reason why so much in-game acting feels like imrov
- aiming for higher percentages of well-crafted performances
    - can’t get there if all the actors just met for the first time that day

Getting your key actors together to establish character traits and relationships is crucial to getting a great performance out of them. Review your storyboards, character sheets, concepts...whatever you have that will provide insight into the scenes. You don’t want to be figuring that stuff out on set as it will often lead to rushed decisions and a “good enough” attitude when calling A takes. It often takes many iterations to get a scene dialed and all of the nuances figured out. There have been occasions where really amazing performances happened on take one with no rehearsals, but these are rare and not something you can expect regularly. There’s a reason why so much acting in games feel like an improv performance. It often is. We are aiming for higher percentages of well crafted performances. You can’t get there consistently when all of your players just met for the first time that day.

Preparing For The Shoot... Rehearsals

Tuesday, 9 April, 13

Points:
- most assume rehearsals are only for cinematics
  - just as important for gameplay
- not just for talent, but designers, programmers, AND animators
- helps define details
- don’t want to stall a shoot to clarify a detail from a designer or engineer
- also promotes inclusion and ownership among the feature group
- also good time to remind stakeholders this is last chance to make larger decisions without bigger implications down the road

When most think of rehearsals, they assume it’s only for cinematics, but I think it’s just as important for gameplay. Not only for the talent, but getting your designers, programmers, and animators together to work through the shoot without the cameras rolling helps to define all of the details in a feature. As before, you don’t want to stall the shoot to get a designer or engineer to come clarify something that could have been figured out ahead of time. The bonus is that it promotes inclusion and ownership amongst the feature team to get together and work through the feature in person. It’s also a good time to remind all stakeholders that this is their last chance to make large design changes without bigger implications down the road.

Things you want to have dialed are...

- style
- start and end poses
- durations
- speeds

Preparing For The Shoot... Rehearsals

Tuesday, 9 April, 13

Points:
- can also use rehearsal time to cover other little tasks
- fitting head mounted cameras, explaining the mocap process if they're new, catering, etc.
- doesn't seem like much, but can add up to considerable time

You can also use the rehearsal time to cover some of the other little tasks that tend to add up to a lot of waiting come shoot day.

Fitting for the head mounted cameras, giving the actors a quick rundown of the set and pipeline if they're new to performance capture, catering/special requests, etc.

It may not seem like much, but can take up considerable time in the morning to do these kinds of things and by the time it's sorted out you only have an hour to shoot before lunch!

Preparing For The Shoot...

Sets/Props

Points:
- last major bit of prep work before the shoot, preparing set/props
    - can be one of the biggest time savers for shoot
    - few takes don’t require a prop or set
- don’t surprise vendor, especially with complex fabrications
- send 3d file so they can integrate if possible
- helps actors and director visualize and become more immersed in the scene
- working with vendor to lay out and mark off sets ahead of time can eliminate a huge amount of time in between takes
    - take photos as you go for reference
- same for props
    - vendor should already have prop list, but never hurts to go over them in person
- give dimensions and est. weight
    - for me, weight is more important than dimensions
    - easier to move limbs a little than add weight and inertia

The last major piece of prep work is preparing the sets and props. This can be one of the biggest time savers for a shoot. There are few shots that don’t require a set or prop of some kind. Getting together with the mocap crew to layout and mark off the sets ahead of time and integrate the props into the scenes (if they have realtime visualization) can eliminate a huge amount of time figuring out how to create them in between takes. Take photos as you go so you’ll remember the setup.

This goes for props as well. By this point the mocap studio should have your shotlist which includes your list of props with their descriptions and dimensions, but it never hurts to go through them in person and make sure they will work for what you need. For me, the weight of the prop is more important than the dimensions. It’s much easier to readjust the position of a limb in post, but trickier to add or remove weight, so check that as well.

Points:
- few takes don’t require a prop or set
- don’t surprise vendor, especially with complex fabrications
- give dimensions and est. weight
- send 3d file so they can integrate if possible
- helps actors and director visualize and become more immersed in the scene

There are few takes that don’t require a prop or set of some kind. Don’t surprise your mocap studio at the last minute with a request, no matter how trivial. This is especially true for items that might need to be fabricated ahead of time. If at all possible, try to list the dimensions (and estimated weight, if it’s an interactive prop or set piece).This way they can anticipate the needs of each shot and have everything on hand, saving you valuable time. Supplying them with the 3D file is great as well. If the studio is set up with realtime visualization, they can integrate the prop or set ahead of time, which really helps both the directors and actors visualize and become more immersed in their scenes.

Preparing For The Shoot...

Sets/Props

Tuesday, 9 April, 13

Points:
- didn’t allow time for this on the first cinematic Hitman shoot
  - estimate it cost several hours shoot time
- second shoot, spent a day with the crew to assemble, tape off, photo, and dissasemble
- flew through setups the following week
- nominal cost that will pay itself back many fold
- if you can’t be present, vendor can usually do it themselves with 3D files.
  - better if someone from team is there, but acceptable
- last details
  - print multiple copies of script and shot list
  - check catering and any other services needed
  - check facilities and that they meet the requirements set out for the talent

We didn’t allow time for this on our first cinematic shoot for hitman and I would estimate it cost us at least a few hours of shoot time during the week. For the second shoot, I spent a day with the mocap crew assembling, taping off, photographing, and disassembling the sets and we flew through the shots the following week. It’s a nominal cost and will pay itself back many fold during the shoot.

If you or someone from your team can’t physically be there to do it, you should be able to send your mocap vendor trimmed down 3d versions of your sets and they can do this work on their own. I find it goes quicker if someone from the team is there, but this is an acceptable alternative.

Last details: print off or have the mocap studio print off multiple versions of the shotlist and script if and check that catering and any other services have been booked (like makeup if you’ll be doing any press during the shoot).

The Shoot...

Tuesday, 9 April, 13

Points:
- now we have everything in order, everything booked
- ready to shoot!

So, now we have our final shot list. The shoot space, actors, and catering are all booked. Props and sets prepared ahead of time and we’re ready to shoot.

The Shoot...

Tuesday, 9 April, 13

Points:
- first thing, establish roles
- whomever is directing shoot should be the main person providing direction and feedback to talent
    - comments and changes from others ok, but should be relayed via director
    - can get messy fast if talent is getting direction from several channels at once
- need someone to track takes, script changes, and any other notes
    - good role for someone new to mocap, get's them involved and learning the ropes
- if there are a lot of talent and a complex shoot, a wrangler may also be needed

Right out of the gate, you want to establish some roles if you have more than one team member attending the shoot. First off, whomever is directing the shoot, should be the main person providing direction and feedback to the talent for the duration of the shoot. Comments and changes from others are fine, but it should be relayed to the talent via the director. It can get messy fast if the talent is getting critique from several channels at once.

Next, you need someone to keep track of the takes, script and dialogue changes, and any other notes and changes that occur. Write this stuff down as it happens on one of the shotlists you printed out. Don't assume you'll be able to remember it later because you won't. This is a great role for an animator or producer new to the process as it gets them involved and learning the ropes quickly.

If you have a lot of actors on set and a complex shoot schedule, someone who's job it is to wrangle the talent and make sure they are suited up and are ready when needed can save a lot of time.

OTHER ROLES?

The Shoot... Establishing Roles

Tuesday, 9 April, 13

Points:
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- whomever is directing shoot should be the main person providing direction and feedback to talent
    - comments and changes from others ok, but should be relayed via director
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OTHER ROLES?

The Shoot...

Tuesday, 9 April, 13

Points:
- also establish where your b-roll cameras will be
- get at least two angles, at least one is a total shot
- second camera should be 90 degrees off from the first
    - have had good results from roaming hand-held as well (will require an operator)
- good for many things, mainly reference, choosing ranges, and browsing scenes later on

You will also want to establish where your b-roll cameras will be. I strongly suggest getting at least two unique angles, one of with should be a total capturing all of the actors and space for a performance.

Your second camera is usually best as a total as well, rotated 90-degrees from the first. I have also had good results from a roaming hand-held as the second camera but have sometimes missed key action due to this.

b-roll is great for several purposes. Mainly, it’s great reference for polish later on, for choosing your frame ranges you want delivered, and makes browsing your scenes later on much faster than opening up the 3D files.

The Shoot...

B-Roll

Tuesday, 9 April, 13

Points:
- also establish where your b-roll cameras will be
- get at least two angles, at least one is a total shot
- second camera should be 90 degrees off from the first
    - have had good results from roaming hand-held as well (will require an operator)
- good for many things, mainly reference, choosing ranges, and browsing scenes later on

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The Shoot...

Tuesday, 9 April, 13

Points:
- few other common sense things: The Three P’s
- Punctuality: get there before talent or have someone that will be
- Positivity: every take is awesome!
    - any critique should be given in a way to improve what is already great
    - Talent can be frustrated or difficult, don’t let it seep into the performance
    - keep it productive, supportive, and fun
    - shoot angry, and you won’t get the data you need
- Professionalism:
    - just like the project, the shoot can be stressful and tiring
    - do best not to bring that onto the stage
    - keep it professional and tightly organized
    - if you’ve done your prep work, this will be less of a problem

A few other things that should be common sense but aren’t.

Punctuality. Be there or time or if you’re always late, assign someone to be there for you. Someone from the team should be there before the talent so they’re not left wandering around wondering what’s going on.

Positivity. For the talent, every take is awesome. Any critique you have is only to squeeze the highest possible amount of awesome from the performance. No matter how frustrating or difficult the talent might be, and it will happen, if you let it show the performance will only deteriorate from then on. Keep the culture on set to be productive, supportive and fun and you will get the data you need. If you shoot angry, you’ll start settling for “good enough” takes and I promise you that once you get them back to the studio and on a character, they won’t be.

Professionalism. Just like the project back at the studio, mocap shoots can be stressful and tiring. Doing your best not to bring that stress into the stage when capturing is best for everyone involved, especially the actors. Keep it professional and tightly organized.

NEED MORE HERE?*

The Shoot...

The Three P's

Tuesday, 9 April, 13

Points:
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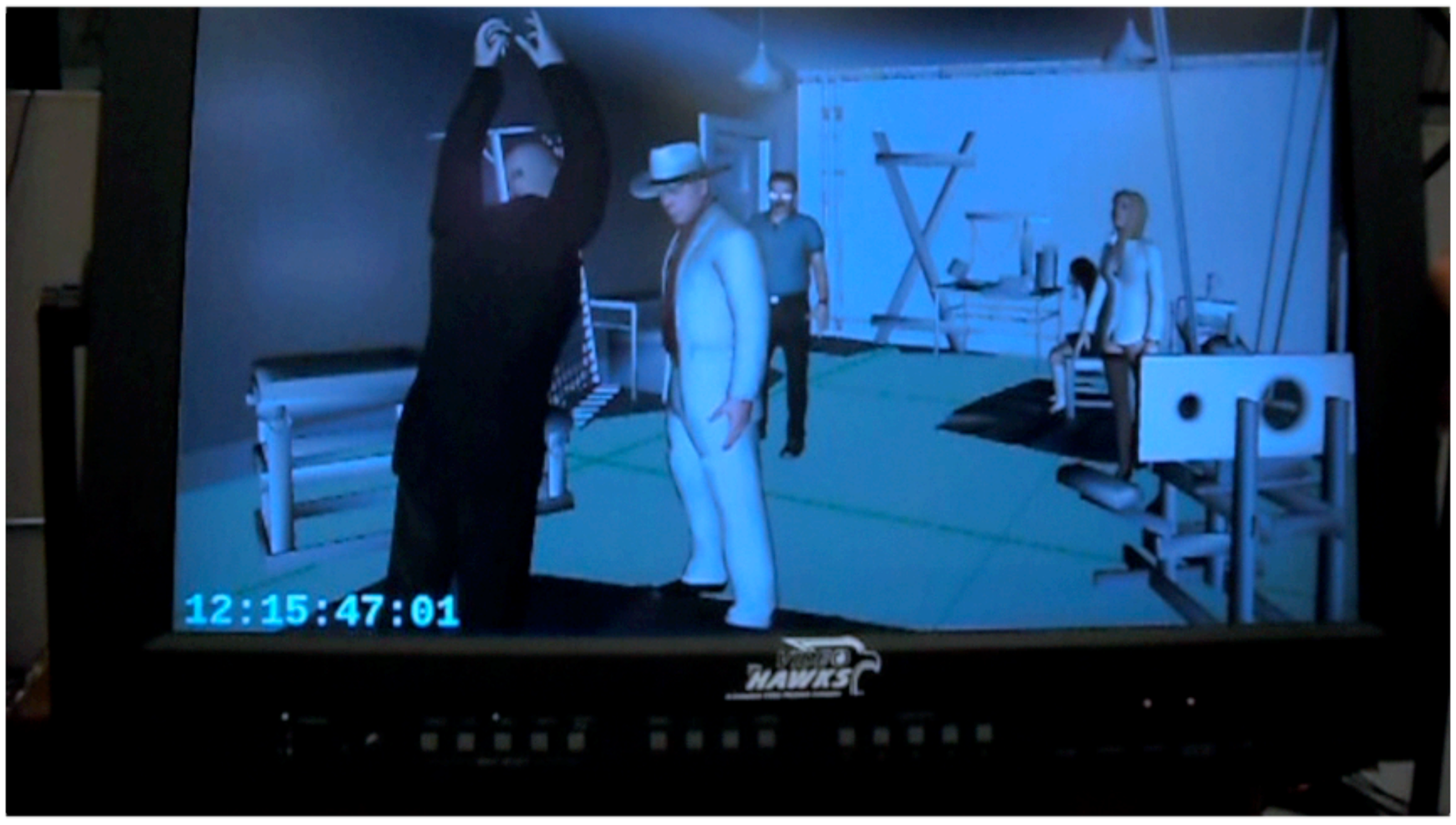
The Shoot...



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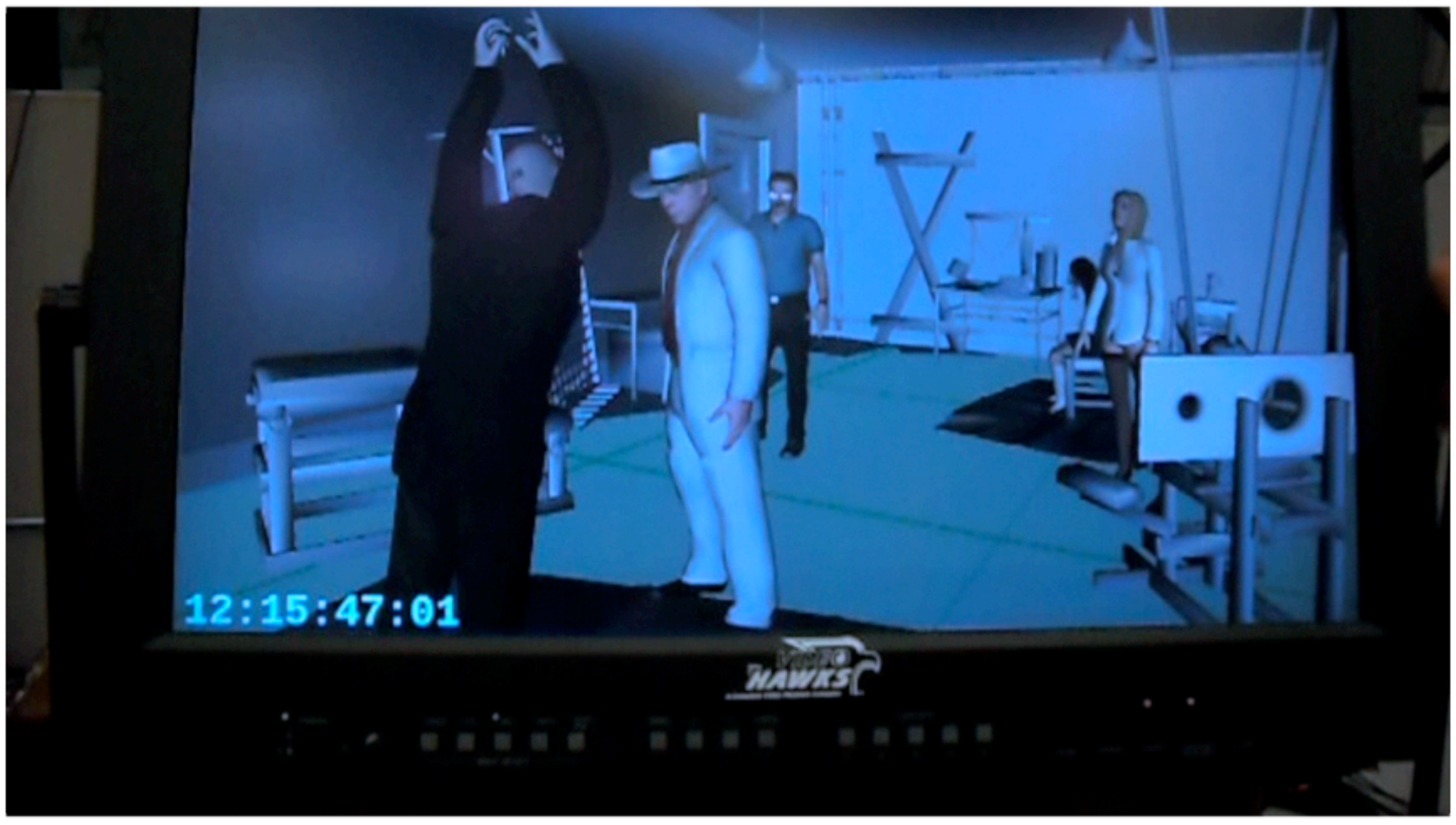
Points:
MULTI PERSON TAKES...
- exponentially more difficult when two or more actors at same time
- leverage technology to your advantage
- use a great take from actor 1 with the best performance from actor 2 in another

Multi-person takes.

As mentioned earlier, mocap becomes exponentially more difficult when you shoot two or more actors at the same time. The great thing is that you can leverage the technology to your advantage. Using a great performance from Actor 1 from one take and keeping the best performance from Actor 2 from another.

The Shoot... Multiple-Actor Shots



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The Shoot... Multiple-Actor Shots

Points:
- can also layer takes to get highly complex, multi person scenes with fewer actors than you'd think
- for MVP 06, I made a 16-person dogpile celebration using only two actors
- comes down to careful planning and breaking down into modular chunks
- most of the cinematics I did on sports contained a minimum of five to six characters, sometimes up to 20, rarely shot more than three

You can also layer takes to get highly complex, multi person scenes with fewer actors than you would originally conceive. For MVP Baseball 06, I was able to create a 16-player dogpile celebration using only two mocap actors. All it comes down to is careful planning and breaking down your scenes into digestable chunks. In fact most of the MVP and NBA live cut scenes we made contained at a minimum five to six characters, sometimes up to 20, and we rarely shot with more than three actors on set at any time.

The Shoot... Multiple-Actor Shots

Tuesday, 9 April, 13

Points:
- an example, 10 players on court, ball passing, specific timing
- shot using only three actors
- came with an animatic and clear breakdown
- took little time to shoot and was fairly straight forward to assemble in MoBu

Here is one example of what I'm talking about. 10 players on the court, ball passing between multpile characters, and very specific timing. We shot this using only three actors.

We showed up with an animatic and a very clear breakdown of who would be playing each role and where our overlaps would be so we could stitch together later in MotionBuilder and it took very little time to shoot.

The Shoot...

Combat

Points:
COMBAT...
- due to limited time, can’t go into every game area
- one area has bad habits from film/TV, hand to hand combat

Due to time constraints, I can’t go into every game area in too much detail, but there is one area I feel we have inherited some really bad habits from Film and TV. Hand to hand combat.

The Shoot... Combat

Points:
- stuntmen don’t want to punch each other in face all day
- came up with a way to illustrate impact without contact
- exaggerated pull back after “impact”
- works for close and mid shots, erratic camerawork
- pulled back to a wider shot, like gameplay cameras, it looks cartoony
- lacks impact or force

Because film and tv stuntmen don’t actually want to punch each other in the face every day, they had to devise a way to illustrate impact and show force without actually making contact. This is often done with a very exaggerated pull back immediately after the impact is supposed to take place. This works great for close and mid shot fight sequences and erratic camera work, but when you pull back to a full body shot like most of our third person gameplay cameras do, it looks cartoony and overacted. Most of all, it lacks impact and force.

The Shoot... Combat

Points:
- one case where reference is really key
- real life footage is great, but usually erratic, sloppy, and not altogether that cool to watch
- some films do well, but sometimes feel TOO practiced
    - Bane/Batman fight was good for weight and impact
- MMA great to show punch impacts and weight
- not how forceful and visceral the impacts are compared to the last slide
- the limb stops or ricochets off the target, instead of bouncing back
- to do the pull back, actors can’t put their weight behind it like if they were really hitting
- how do we do this without breaking all of our actors?
- some ways to get closer, but all require the animator to plus the performance later in post

This is one of the cases where you really need to choose your reference carefully. Real life fight footage is great for impact reference, but is usually erratic and sloppy. Some film fights do a good job of showing the weight and force of the impacts, but they also sometimes feel too choreographed and practiced. Some of the hits in the Bane and Batman fight, for example, had a lot of weight and force behind them. I also like MMA and real-life you-tube footage as it shows a more natural reaction to hitting and being hit.

Notice how much more forceful and visceral the impacts feel compared to the previous footage. The limb making impact either stops at or ricochets off the target rather than pulling back. Also, the person throwing the punch or kick is putting more of their weight behind is as they are expecting to make contact whereas the stage actors are balancing their weight back more to anticipate the draw back.

So, how do we replicate this without breaking all of our actors faces or ribs? There are a few ways we can cheat this, but all require some finessing in post from an animator.

The Shoot... Combat

Tuesday, 9 April, 13

Points:
- if not KO, try to attach as much padding as possible on the impact point
- have them hit as hard as they feel comfortable
- usually only option on more complex, multi hit combos

If it’s not a knockout or fatal blow, I will try to attach as much padding as we can to the impact point on the receiving actor and have them hit as hard as they feel comfortable. Usually on on more complex, multi hit combos, this is our best viable option.

The Shoot... Combat

Points:
- if bigger impact or finishing move...
    - run through once with both, leaving space
    - reset without cutting and replace victim with hittable prop
    - mark places and keep the timing tight to rely on muscle memory
- again, animator will have some additional work to do, but will give a much better starting point
    - often exaggerating the antic, velocity, and reaction
    - cleaning up silhouettes in relation to gameplay camera

Alternatively, if you really need a big impact for a larger or finishing move, I have had great results with shooting the move once through with both actors. Maybe leaving a little space between them so they can follow through, then immediately reset, continuing to roll, but replace the victim with a hittable prop and run it again. The key is to mark the foot placement ahead of time and do the moves immediately after each other without cutting as the more time you take between takes the less you can rely on the actors muscle memory to hit the right timing and movement needed to match up to the victim's original take. If your combat design has specific distances to factor, make sure to account for this when offsetting your actors marks.

In both, the animator will have to align the actors and impact points as well as add more weight and force to the hits. Often this means exaggerating the anticipation of the hit, the velocity of it, or the reaction from the victim. Usually varying degrees of all three. You want to push the antic, impact, and reaction silhouettes to be as readable as possible from the gameplay camera's perspective.

The Data...

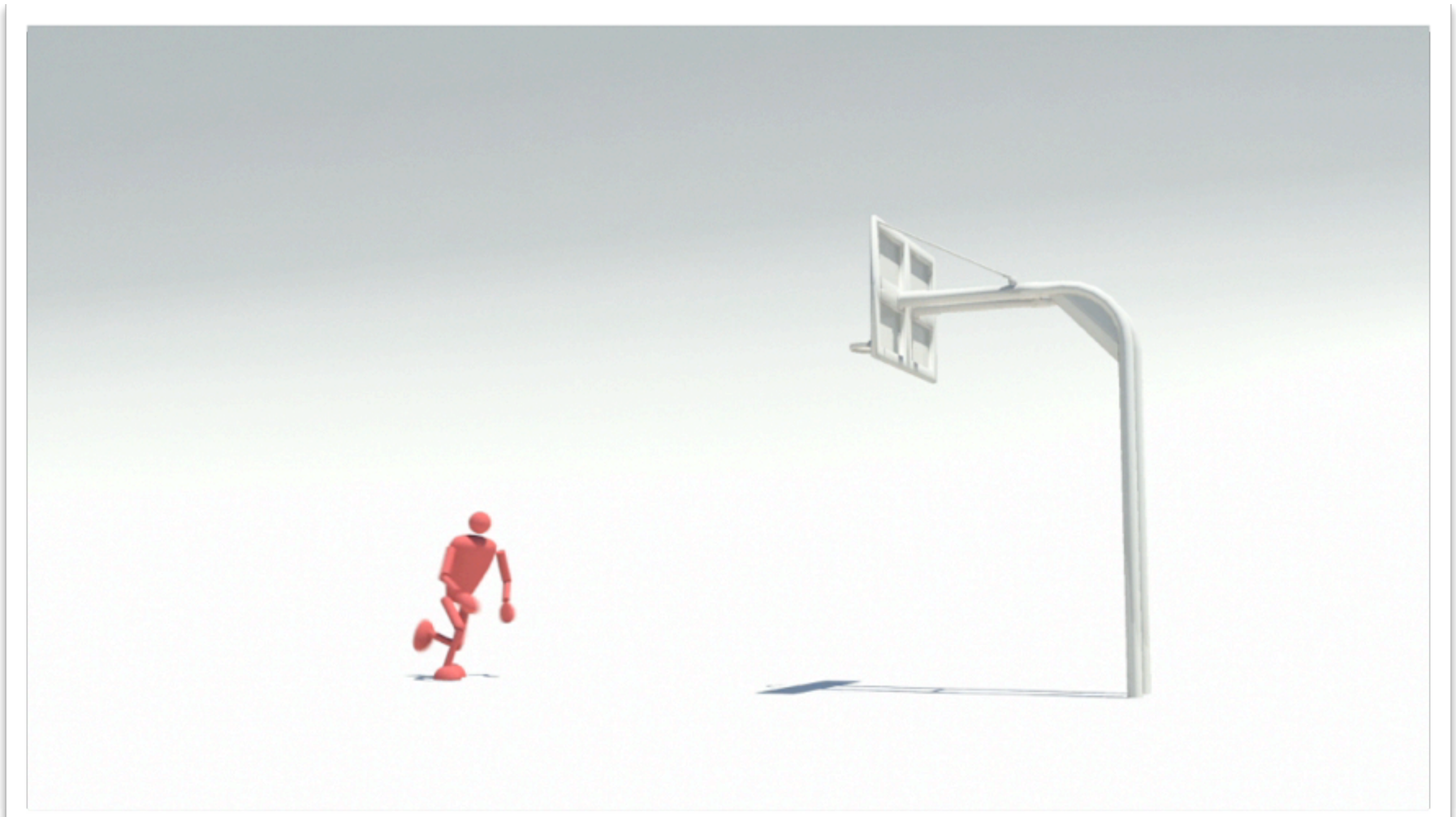
Points:
- leads us to the data
- as seen earlier, straight mocap can look flat, weightless, and lack appeal
- job of animator to take the rough foundation and make it sparkle
- 99% of time, game characters are seen full body
    - requires movement to be broader, more exaggerated to read properly on small screen
- just because much of the movement is done already, doesn't mean we throw out the anim principles
- I still expect animators to look at mocap the same as if they had keyframed it.
- remember, it's a tool, not a product
- let's look at a more extreme version of this from start to finish

So, that leads us to the data.

As we saw earlier, straight mocap can look rather flat, floaty, and a little lifeless straight out of the box. It's the job of the animator to take this rough gem and make it sparkle. Keep in mind, 99% of the time, animated characters we see in our games are shown from head to toe. This requires their movement to bee a little broader and more exaggerated to read properly on a small TV screen. Just because the majority of the movement is done for us, doesn't mean that we throw the principles of animation out the window. I still expect all animators to look at mocap the same way they would something they had keyframed. Remember, this is a tool, not a product.

Let's have a look at a more extreme version of this from start to finish...

The Data...

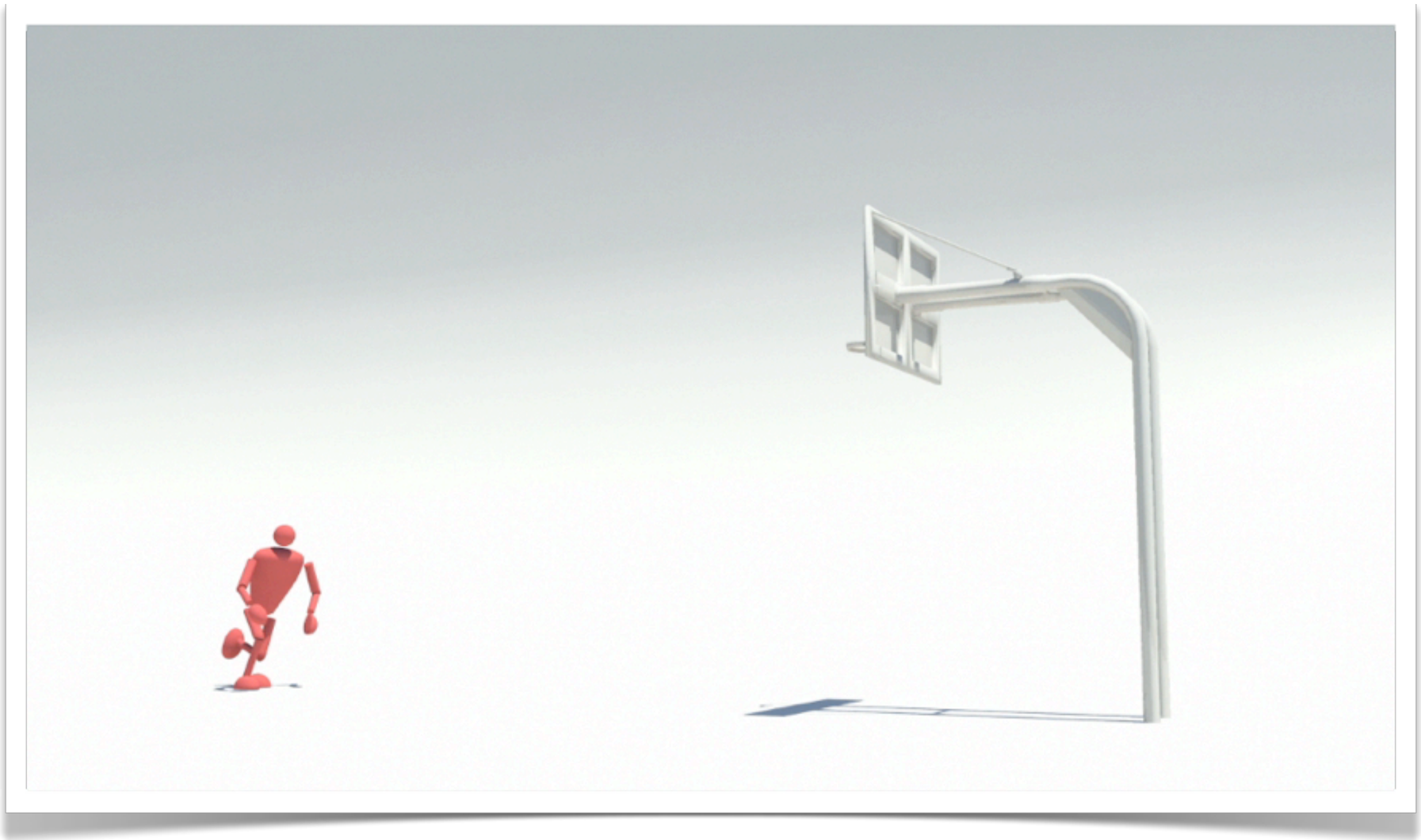


Points:
- This is an actual production example I got from my friend Matt Derksen which was used on NBA JAM
- used to get exaggerated, key frame style in less time than scratch
- first task was to get mocap on character
- general rule when working with mocap, is to do broad strokes first
- when happy, continue on to smaller and smaller details
- best to work in chains, as each point is dependent on its root (arm from the clavicle, leg from the hips, etc)

This is an actual production example of using motion capture to achieve a more exaggerated, key-frame style movement in less time than it would take to do it from scratch. First thing is to get the mocap data on your character...

As a general rule when working with mocap, do your broad strokes first and when your happy, continue on to smaller and smaller details.

The Data...



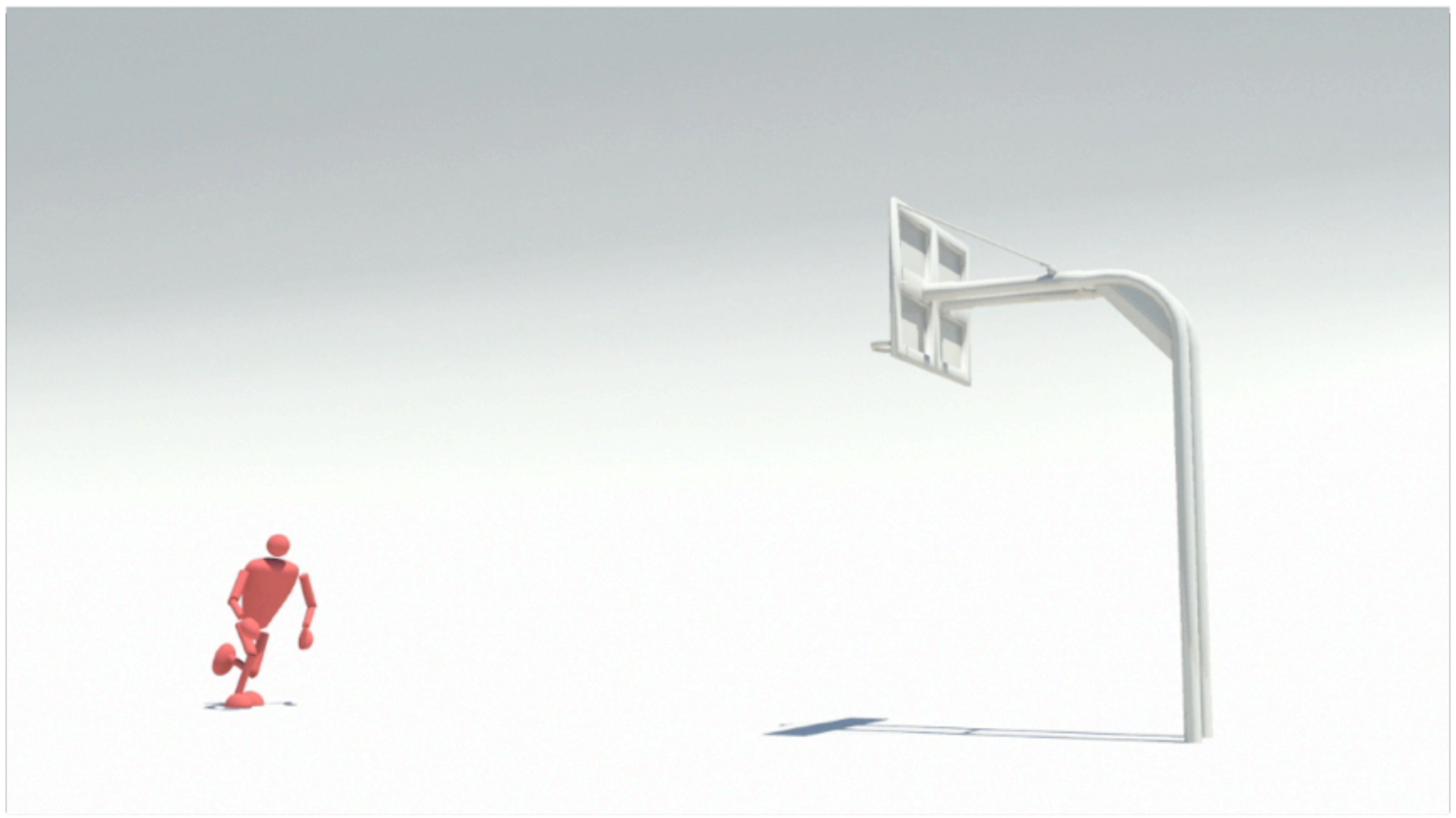
Points:
- first pass is usually a timing one
- normal human cadence too slow for gameplay
- most of the time, will scale entire scene 5-8% faster out of the gate
    - grab whole clip, speed it up until it looks bad, then back it off 10-20%
    - broad strokes first, look at clip as whole at this stage
- in this case, we're stripping the movement down to the main poses and in-betweens and timing it in the fcurves
    - could just as easily done this in the time warper or story mode
- also adding a layer on the root to rough out trajectory
- Broad strokes first!

Once all of the characters have been assembled into the scene and are aligned properly, my first pass on the data is a timing one.

Gameplay requirements and responsiveness dictates that the speed at which an average human moves in real life is just not fast enough. Most of the time, I will scale the entire scene to be about 5-8% faster. Just grab the whole clip, speed it up until it looks horrible, then back it off about 10-20%. Remember, we're thinking broad strokes first so look at the clip as a whole right now.

In this case, we're stripping it down to the main poses and in-betweens and timing it in the fcurves. You could just as easily do this with the time warper or in story mode in Motion Builder also. We're also adding a layer on the root of the character to rough out the new trajectory we are after. Remember, broad strokes first.

The Data... ...Timing



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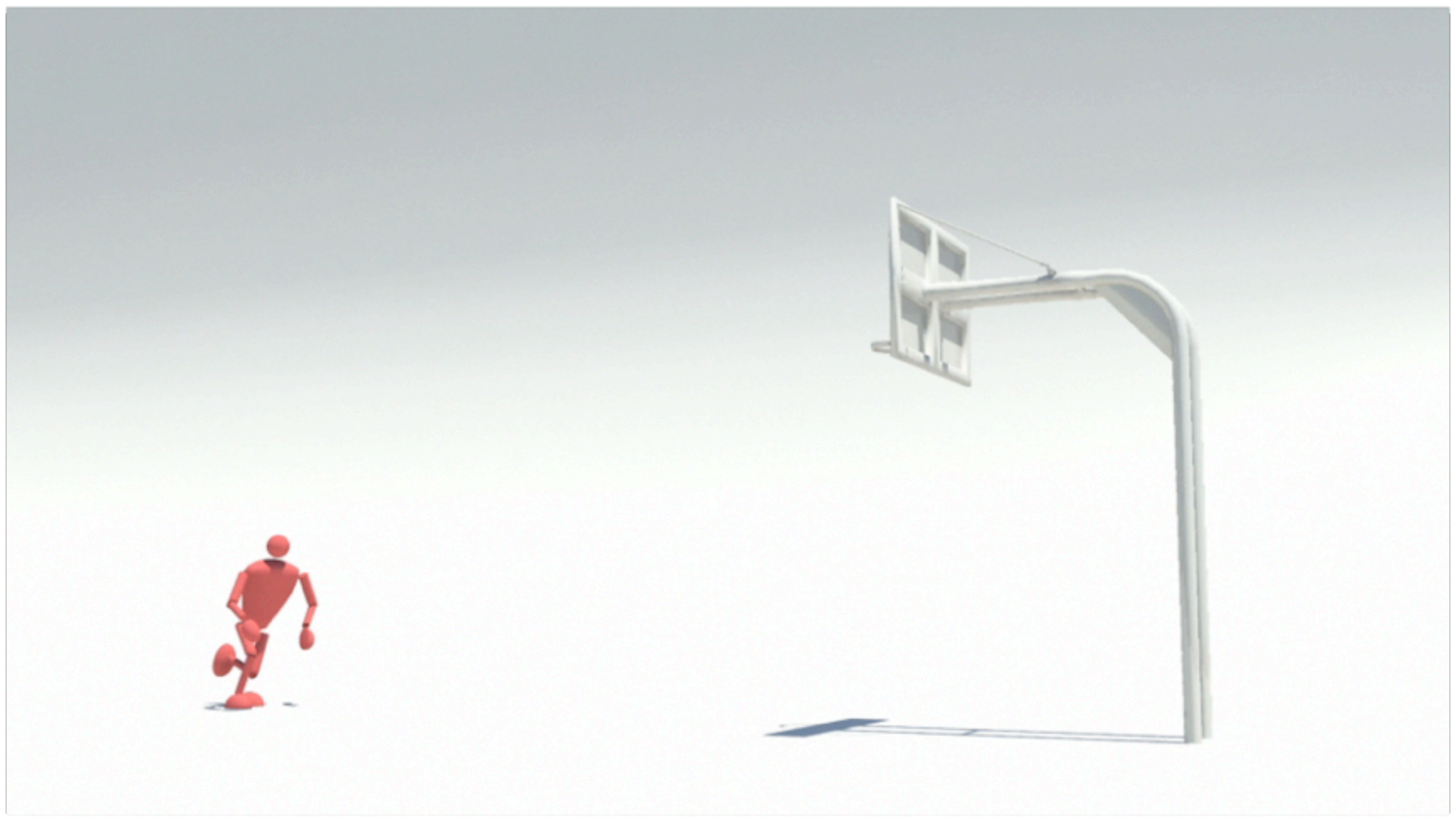
The Data...

Tuesday, 9 April, 13

Points:
- next, adjust spacing
- trying to get closer to the feel we’re after

Next I’ll adjust the spacing between the individual poses in the movement to get closer to the final feel I’m after. Still trying to get as close to the timing feel I’m after.

The Data... ...Spacing



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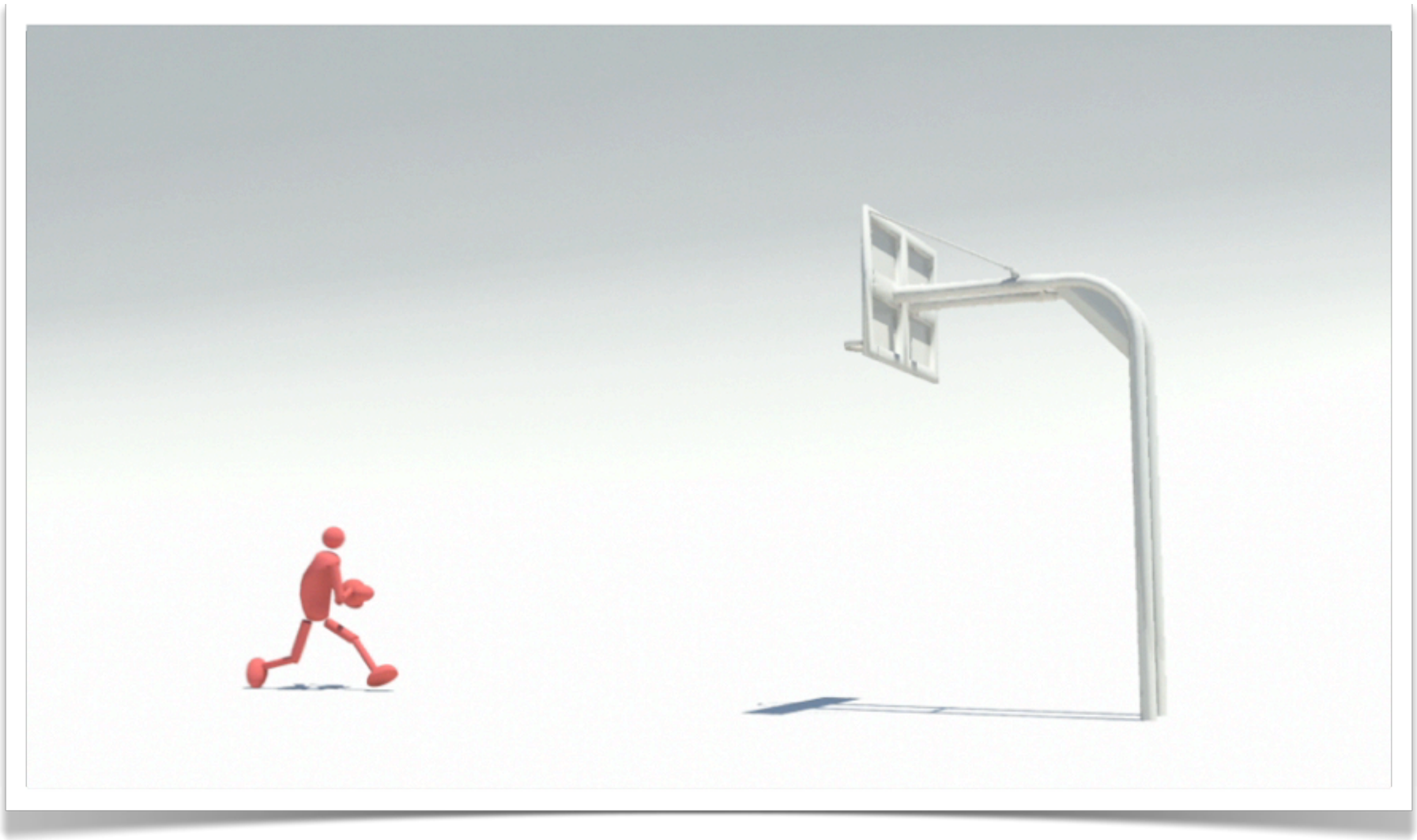


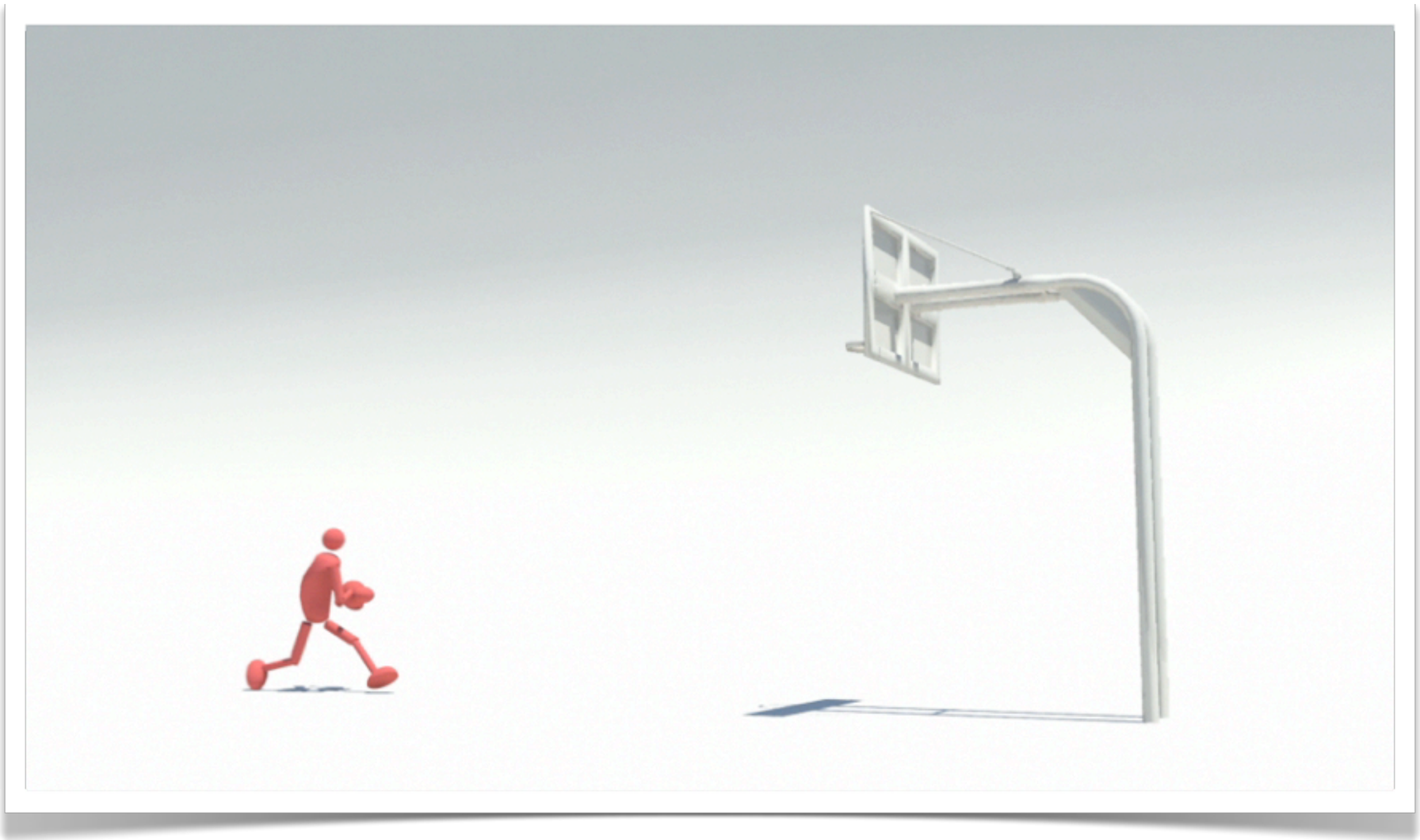
Points:
- after satisfied with timing, look at poses and silhouettes
    - does it read clearly enough
    - where to exaggerate, where to restrain
- in this move, the compression for the jump, peak of wind-up, and slam isn't strong enough yet
- might start paying attention to shoulders now
    - don't often come through the solving that well

After I'm satisfied with the overall timing, I look at the poses and silhouettes of the movement. Are the key movements reading clearly enough for me or can I exaggerate or improve them to be better?

At this stage, I might start paying a little attention to the shoulders as well. Very often, the shoulder movement doesn't come through the mocap onto the character very well and being mindful of this as you tweak and change the poses will help bring more physicality and accuracy to your movement.

In this one, the compression before the jump, peak of the wind up, and slam poses aren't strong enough yet and can be pushed much farther given the style that we're after here.

The Data... ...Poses/Silhouettes



Tuesday, 9 April, 13

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In this one, the compression before the jump, peak of the wind up, and slam poses aren't strong enough yet and can be pushed much farther given the style that we're after here.

The Data...

Tuesday, 9 April, 13

Points:
- last main area is arcs
- start with the root
    - make sure weight and fluidity is there
- move up the spine to the head, making sure it is stable and smooth
- lastly move out to the limbs and props

With that done, I'll look at arcs. Starting with the root of the character, I'll make sure the weight and fluidity I'm looking for is there. I'll usually move out from there to the upper body, most importantly the head. lastly the limbs and props if any.

The Data... ...Arcs

Tuesday, 9 April, 13

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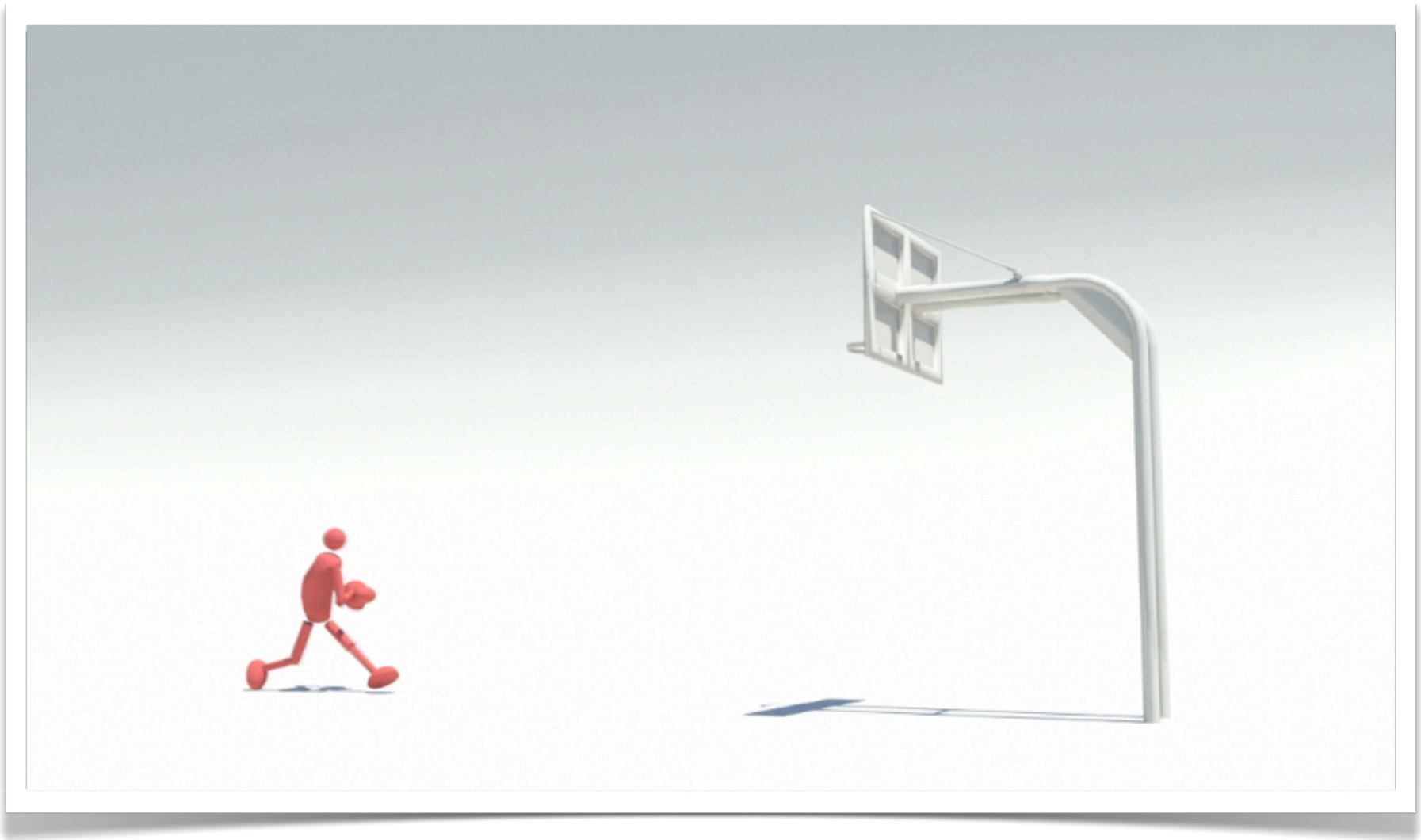

Points:
- glossed over some of the finer details, but broad strokes the same
  - timing, spacing, silhouettes, arcs
- exaggerated movement or subtle acting, all of the principles still apply
- can’t be afraid to get our hands dirty
  - chop out the in-betweens, redo the arms and legs.
- take what works, change or throw out what works
- just because it was recorded from an actor, doesn’t mean it’s perfect

Obviously I have glossed over some of the finer details due to time constraints, but the broad strokes are almost always the same. Timing, spacing, poses, silhouettes, arcs. Whether it’s exaggerated, cartoony movement or subtle acting, these rules apply.

We can’t be afraid to get our hands dirty with the mocap. Get in there, chop out all the in-betweens. Remove all of the arm movement and do it by hand if you need to. Take what works and throw out what doesn’t. Just because it was recorded from an actor, doesn’t mean it’s exactly what you need.

Remember, the end goal is a performance that has appeal and is believable.

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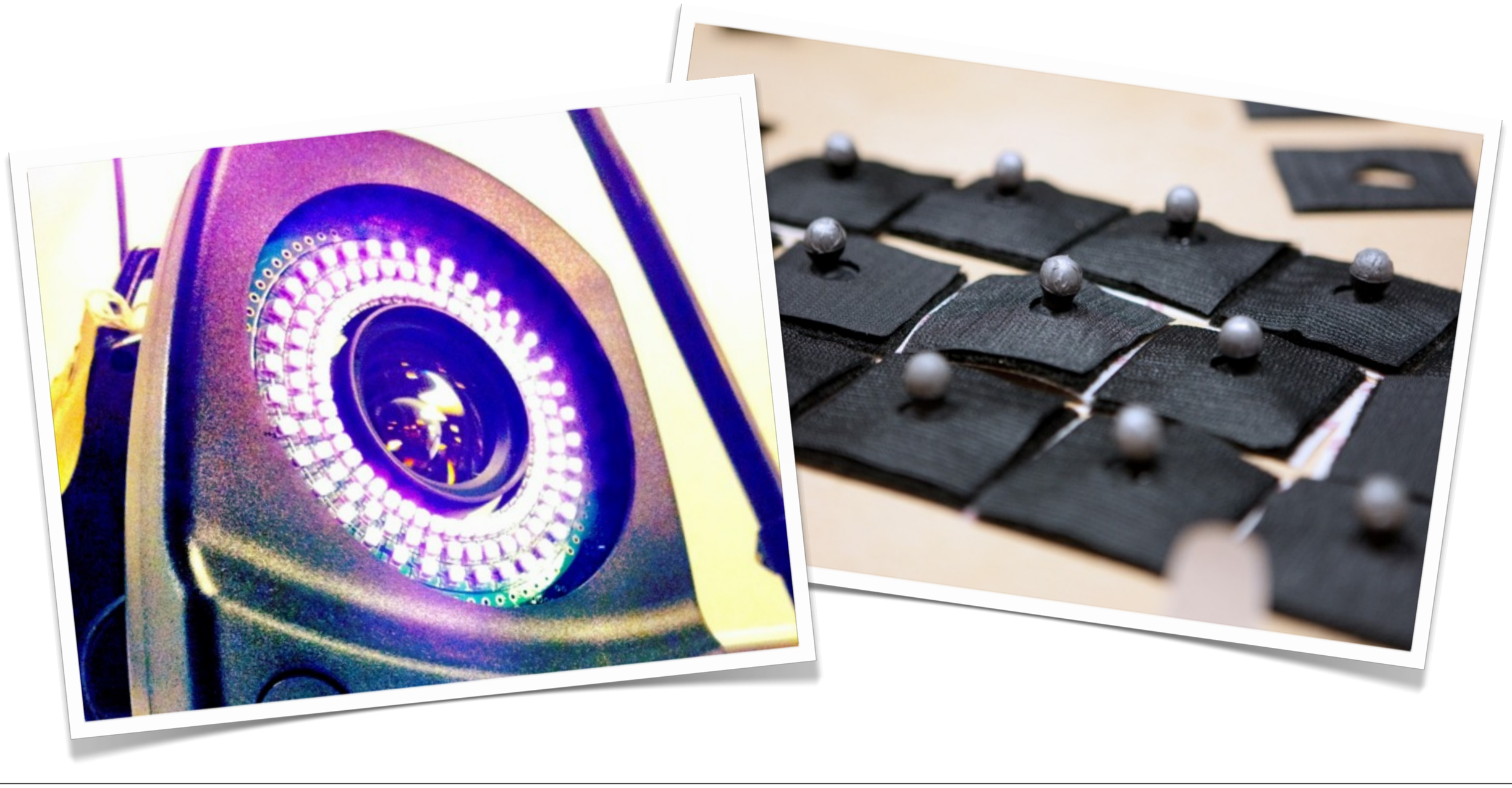

Tuesday, 9 April, 13

Points:
- as mentioned, goal is appealing, believable characters
- leveraging whatever tools is how we achieve this
    - performance capture is one such tool
- allowing time necessary, putting right people in place, and not settling for “Good Enough”
- only immerse users more in our experiences

THANKS, QUESTIONS?

As I mentioned at the start, our end goal is to have appealing, believable characters. Leveraging whatever tools we can to achieve this is how we get there. Performance capture is one such tool. Allowing the time necessary to prepare, putting the right people in place, and never settling for “good enough” is what will get us to the next level in character performance in games. This will only help to immerse the users in the experiences we all work so hard to craft and share with the world.