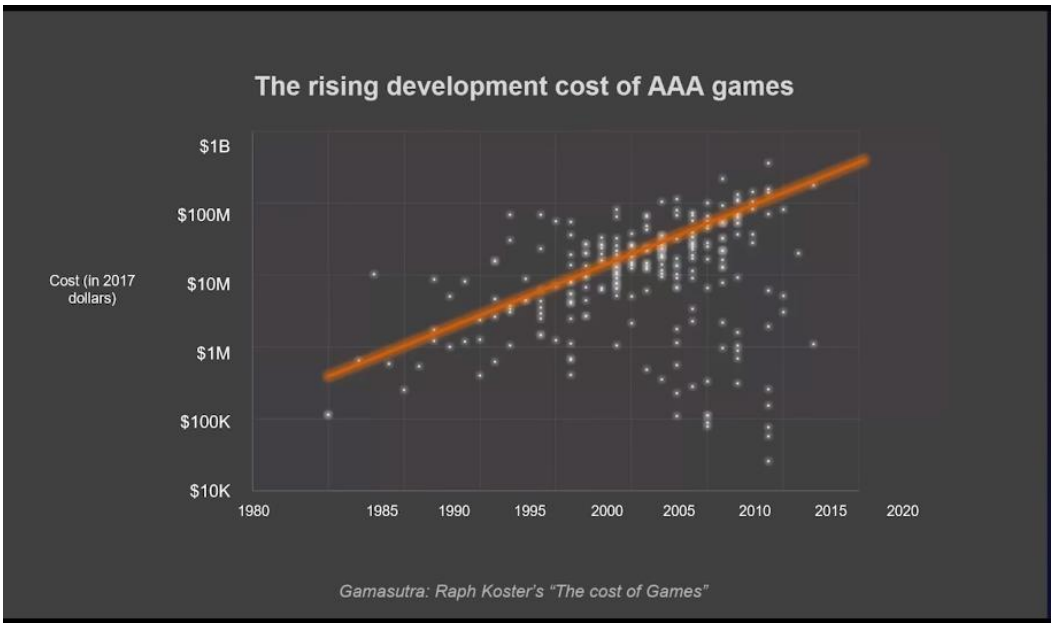
# Why making video games so expensive and will it still be in the future?

**How expensive is to make video games and what can we learn from that?**

First of all, let's see some statistical data about video games developing. Red Dead Redemption 2 is a famous western action-adventure game developed and published by Rockstar Games. It was released on October 26, 2018. Though Rockstar never announced how much money costs to make RDR2 (Red Dead Redemption 2), according to "The DeanBeat: How much did Red Dead Redemption 2 cost to make? (updated)" posted by DEAN TAKAHASHI on venturebeat.com, the author estimates a total development cost of 644.2 million across the seven years to make RDR2 by assuming 6442 employee years times $100,000 a year. This cost is 6,440 times more than making a AAA video game in the 1980s. Here is a diagram shows how much making AAA games cost in the last 30 years.




Now let's take a look at another shocking fact of RDR2. RDR2 takes almost 100 gigabytes in your PS4's hard drive which also indicates that it is the biggest hard drive space required AAA game in the history. In all, Red Dead Redemption 2 is a 100 gigabytes game that cost $644.2 million to develop. So, what part of it raise the cost majorly? The answer is the graphics. In fact, most modern AAA games' mechanisms can be somehow partially realized 20 years ago. But you can never expect a 1980s game looking astonishing as RDR2. This is a picture of a comparison of RDR1 AND RDR2 that shows the leap of graphics.


This answered what is taking 100 gigabytes and hundreds of million dollars. The massive amount of super detailed models and textures, moving sky with realistic weather changing system, real-time shadow rendering, and an indispensable part of modern games – mocap system and Hollywood actors, all these build up a fantastic but also expensive western America.

On Youtube, a video named “The Next Leap: How A.I. will change the 3D industry - Andrew Price” (https://www.youtube.com/watch?v=FlgLxSLsYWQ) gives us a simulation of how much of a single scene in Division cost.

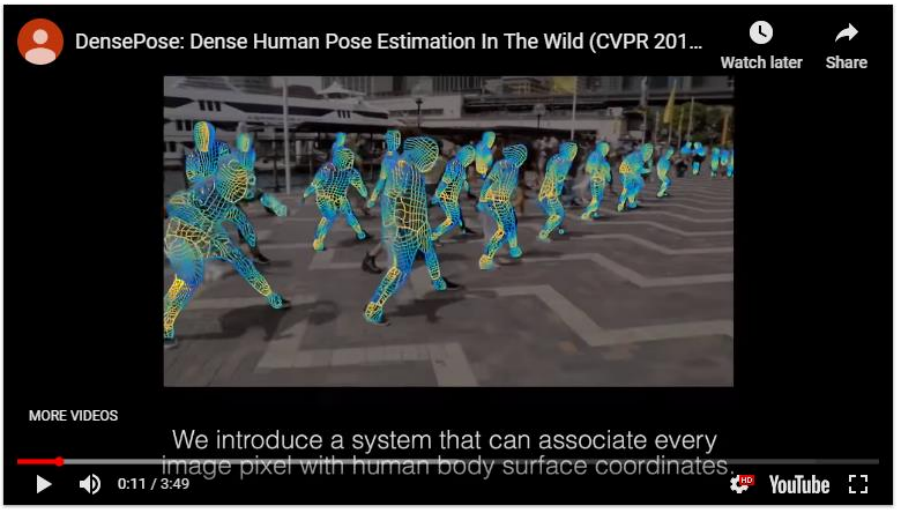

**what has been developed to solve this problem?**

AI and machine learning. With computers did tedious work in 3D animation like tweak details and place objects by hand, a massive amount of time and human resources are saved. Here is an example that shows how Ubisoft solve this problem in Far Cry 5 by using procedural

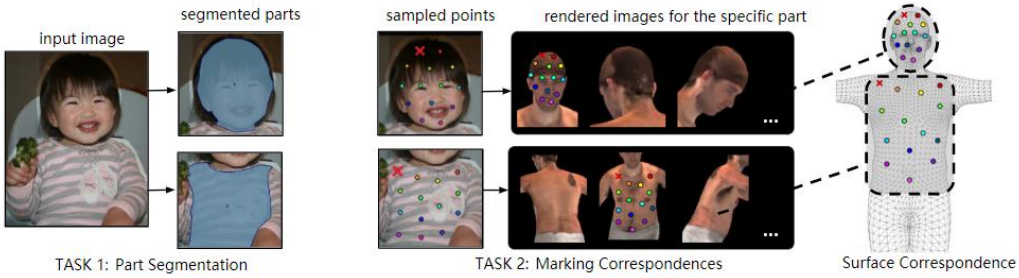
workflow.


As you can see in the image above, the earlier Far Cry games had this problem, the storyline changes frequently during the game production so the objects placed in the scene should be replaced as the story changed, and back then, artists used to move the trees and roads little by little. This costs a lot of money and time. So in Far Cry 5, using Houdini, Ubisoft engineers developed a sophisticated procedural pipeline. Shown in the picture, developers tell computers the rule: big trees grow in the center of the map while shorter trees surround them; mushrooms and bushes grow more around the edge of the forest; the quantity of plants varies in different terrains. Once the rule is settled, the computers will automatically generate a rich and complex ecosystem. Ubisoft is actually applying this tech in the Far Cry series and Assassin's Creed series and it does save them quite a large amount of money.

Another technique is also being used to solve the high expense problem in mocap.



Dense Pose is a powerful tool which has the ability to extract a 3D mesh model of a human body from two-dimensional RGB images. As shown in the screenshot above, you can see how the software captures every person's body motion.




If this could be widely used in the future game industry, we may no longer need the expensive mocap suits and actors.

**Can those techniques/software benefit Indie game developers and small studios?**

The answer is yes. The software mentioned, Houdini, provides Indie version and only cost $269 a year. Comparing to hire 5-10 3D artists and pay them $100,000 a year, this will have a bright future.

Quote from the Houdini page, "The Game industry is facing an explosion of demand for volume and quality of content to create bigger and richer worlds. Houdini Indie's procedural workflow can automate repetitive tasks, and allow game dev teams to generate more high-quality content with a more focused effort. Houdini Indie shortens iteration time, thereby improving game play by allowing for much more variation in the game. Indie pricing is affordable for everyone, including free Engine Indie, while providing the same powerful platform used by AAA developers."

In the near future, we might see Indie games filled with AAA class environment design and realistic graphics.