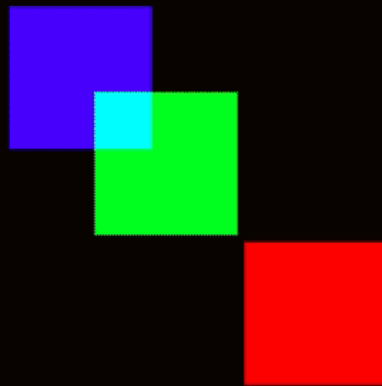


Sensoriamento 3D para imagens



Prof. Dr. Diego Renan Bruno

Education Tech Lead na DIO

Doutor em Robótica e *Machine Learning* pelo ICMC-USP



OpenCV

Falhas na visão 2D

Captura da imagem sem profundidade:

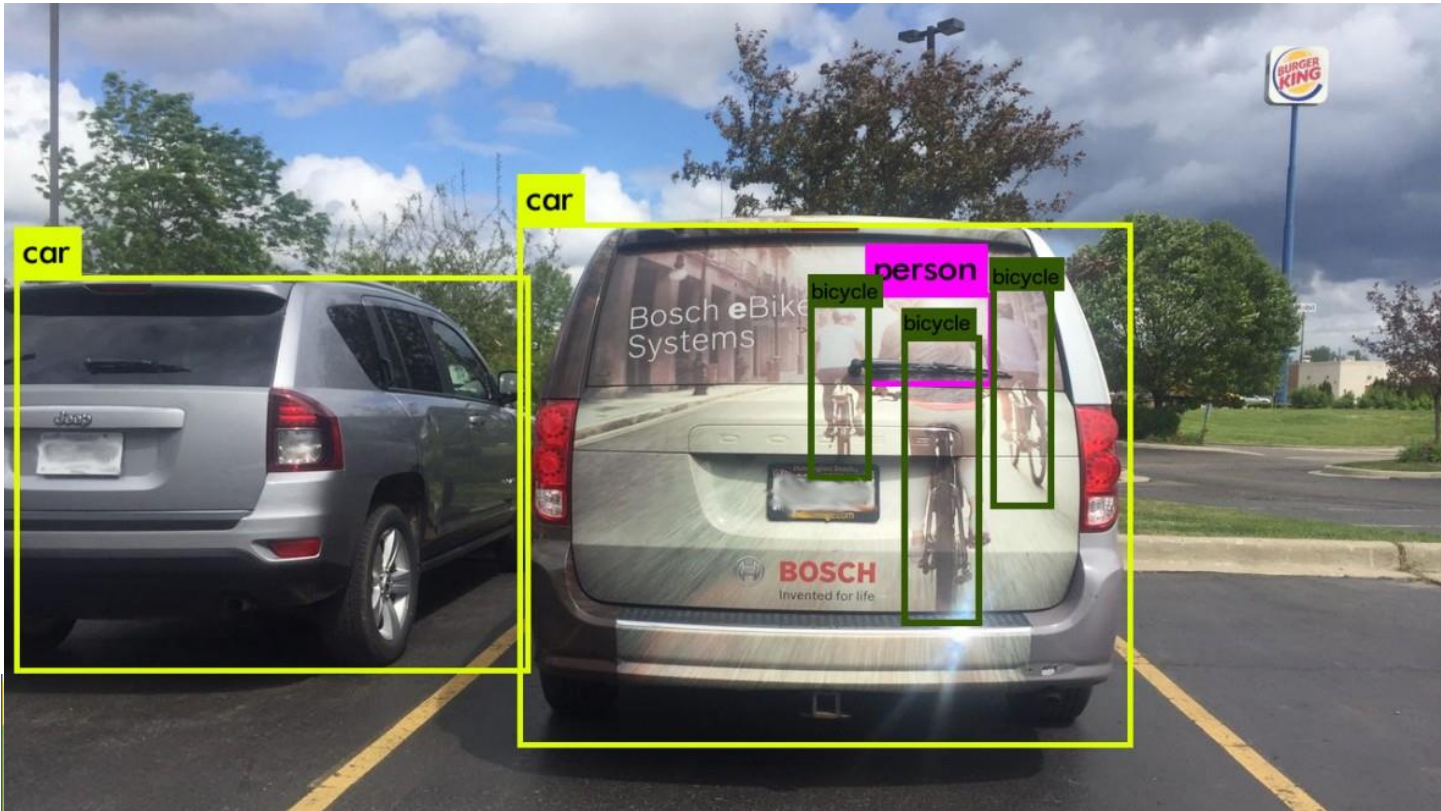


Problemas de visão 2D

AI System – Real Problem



Massachusetts
Institute of
Technology

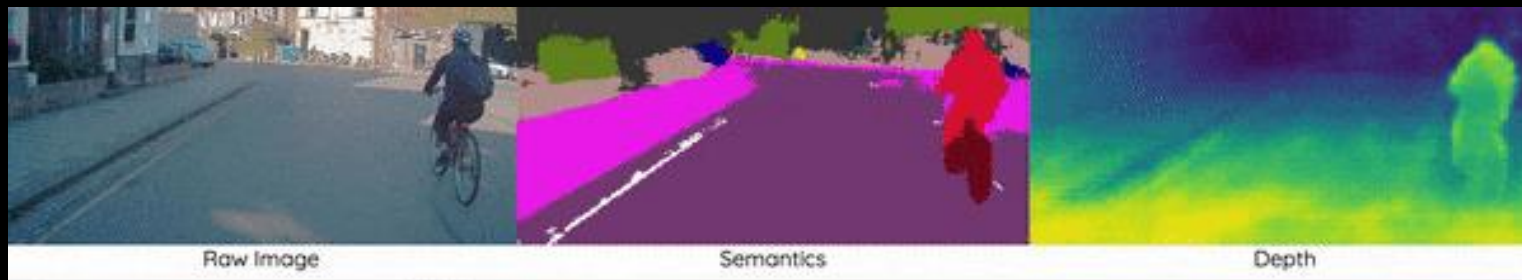


<https://www.technologyreview.com/s/608321/this-image-is-why-self-driving-cars-come-loaded-with-many-types-of-sensors/> But also... Researchers hack a self-driving car by putting stickers on street signs



Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



3D Reconstruction: Rotate/Zoom with your mouse or finger

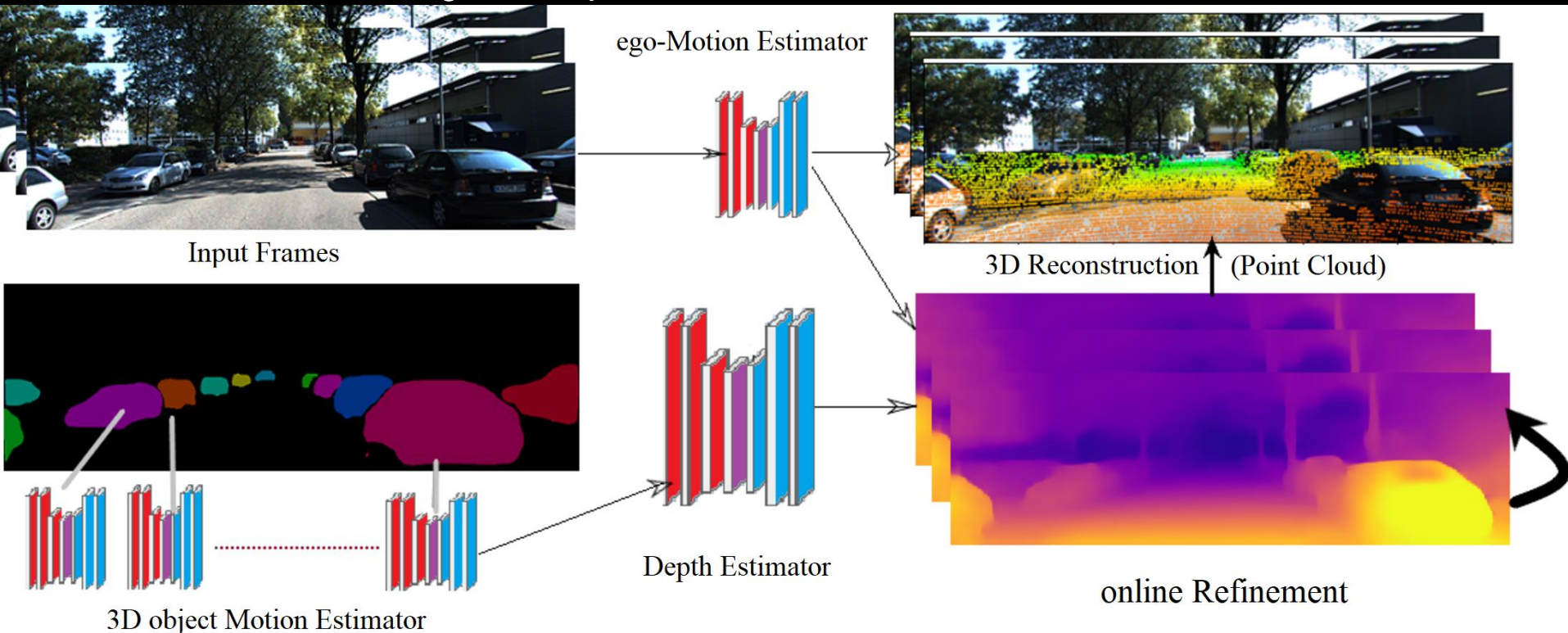


Processed in your browser in 8019ms



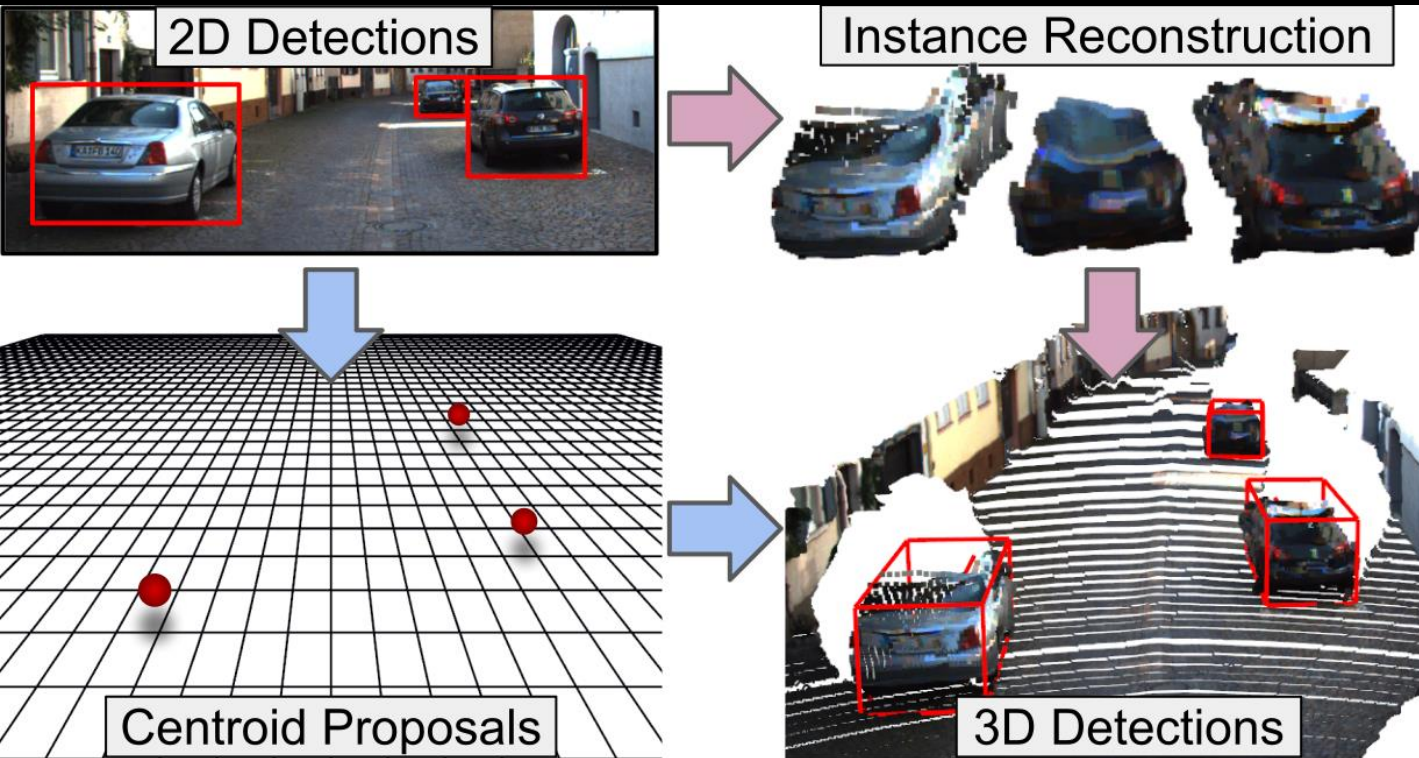
Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



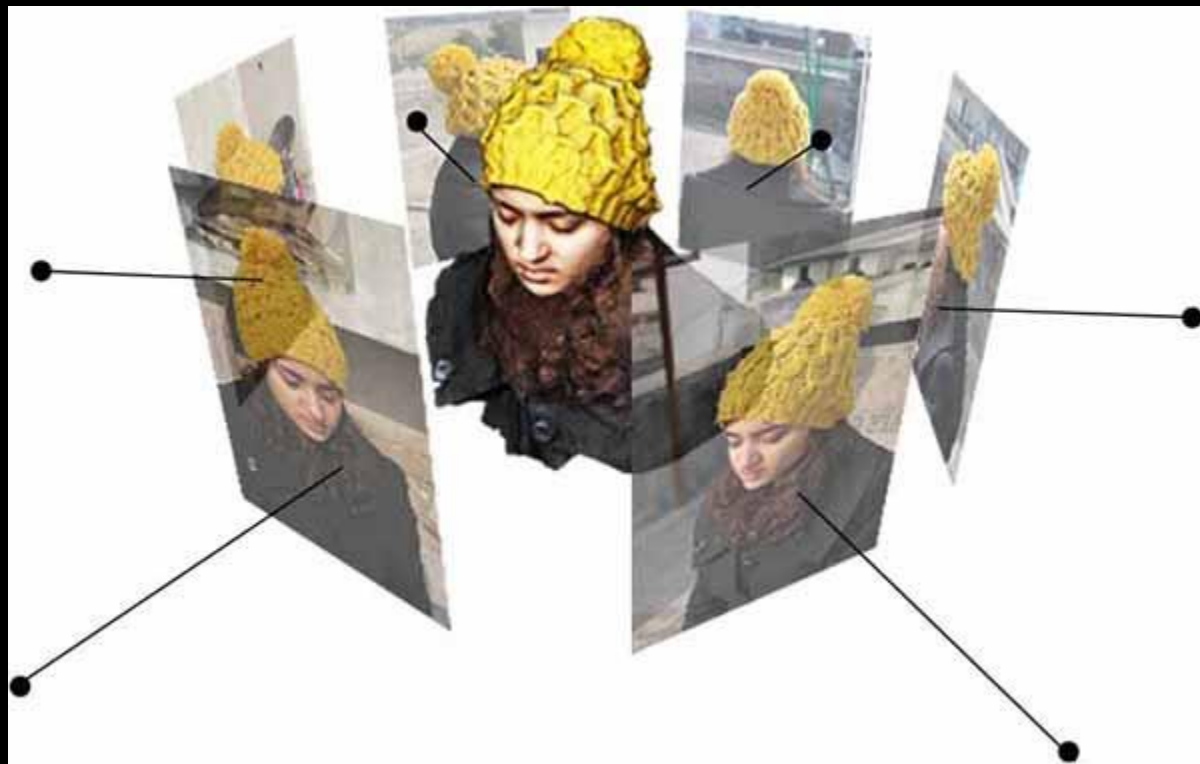
Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



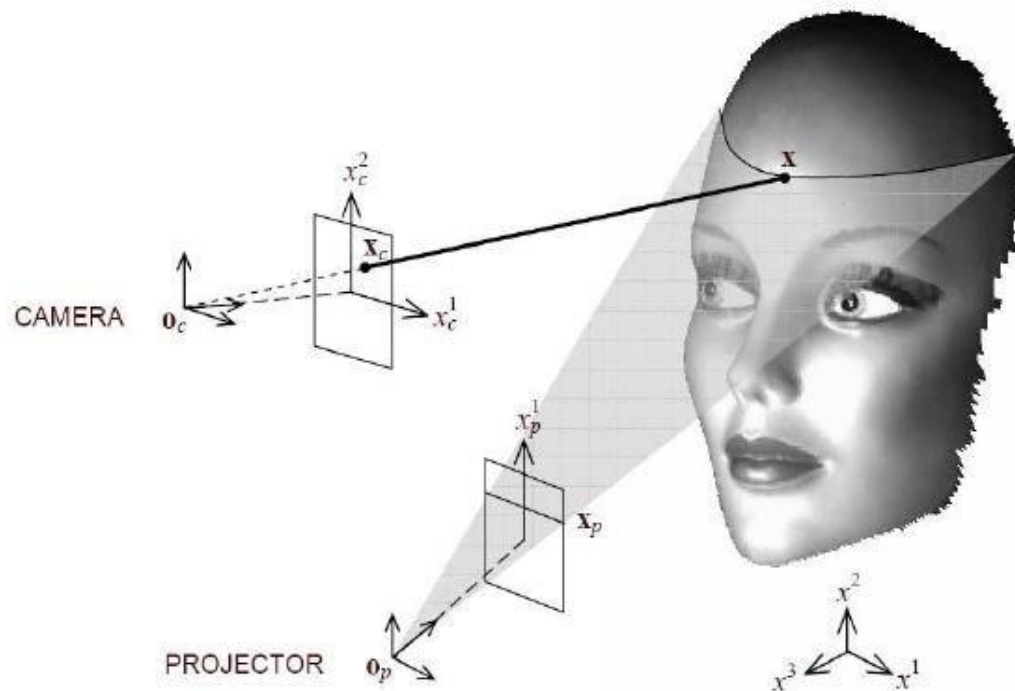
Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



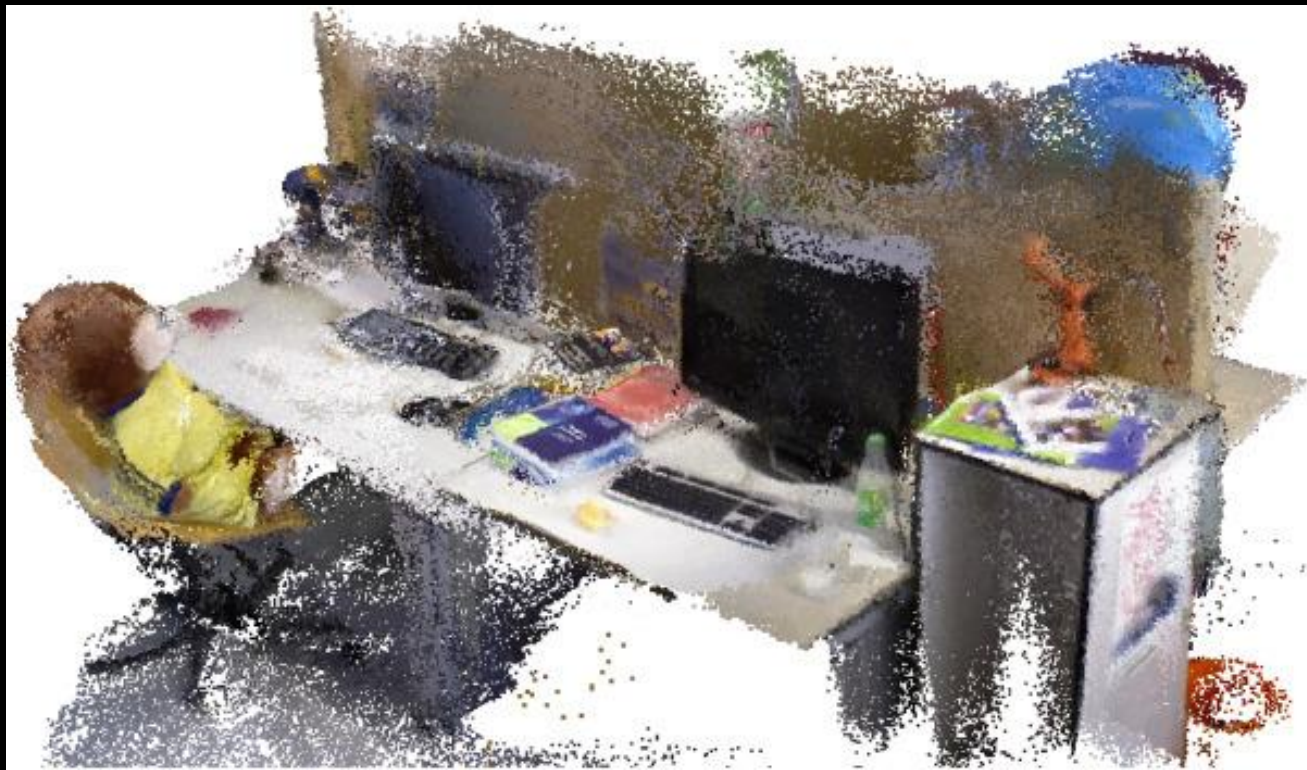
Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



Reconstrução de imagens 3D

Transformar uma imagem 2D para 3D:



Sensoriamento 3D

Sensoriamento 3D por câmara



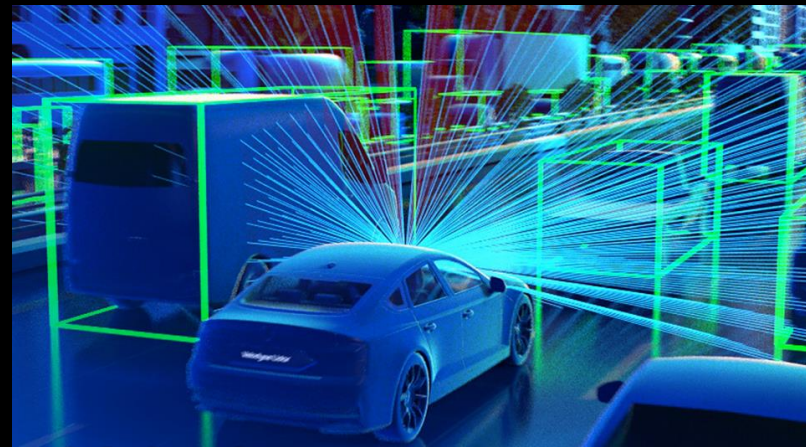
Sensoriamento 3D

Sensoriamento 3D por câmara



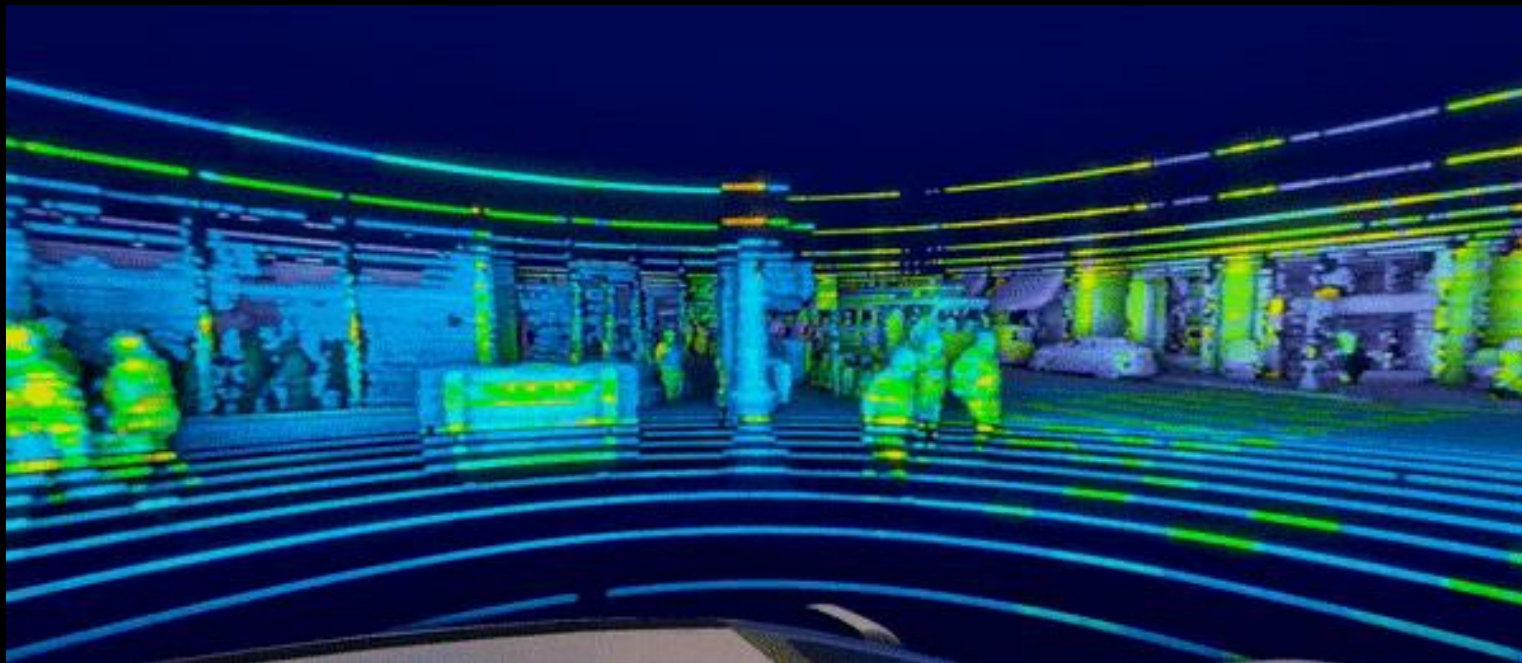
LIDAR 3D

Sensoriamento 3D por laser



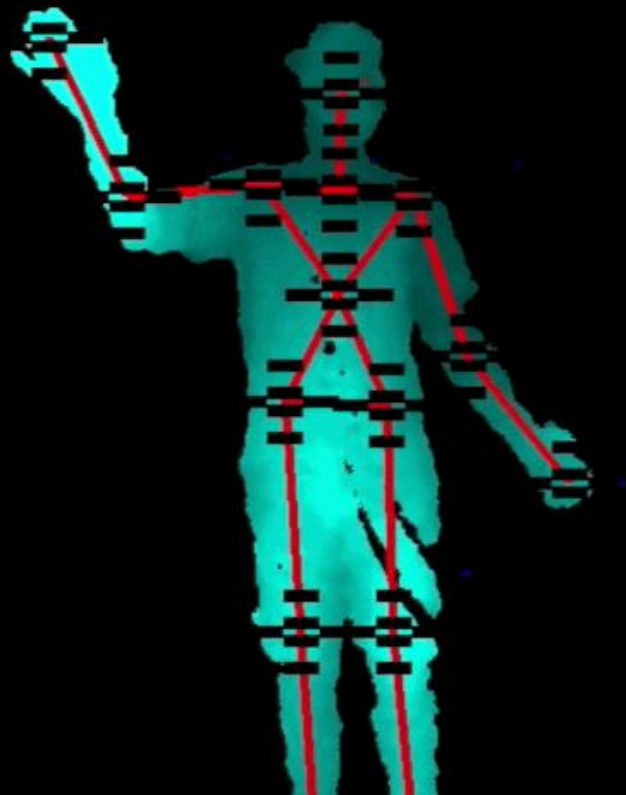
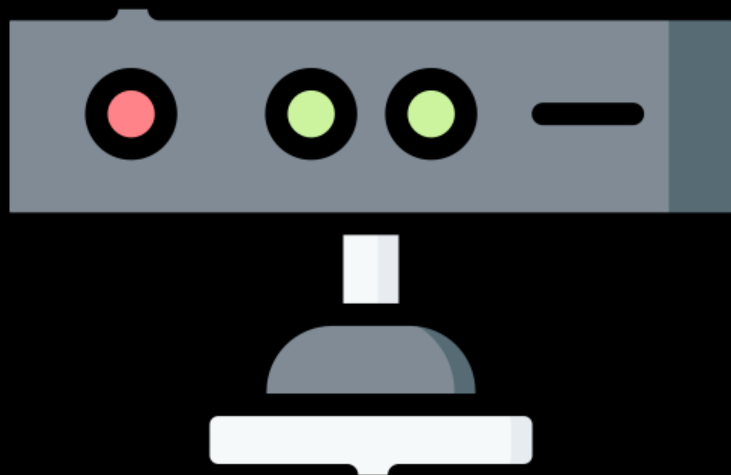
LIDAR 3D

Sensoriamento 3D por laser



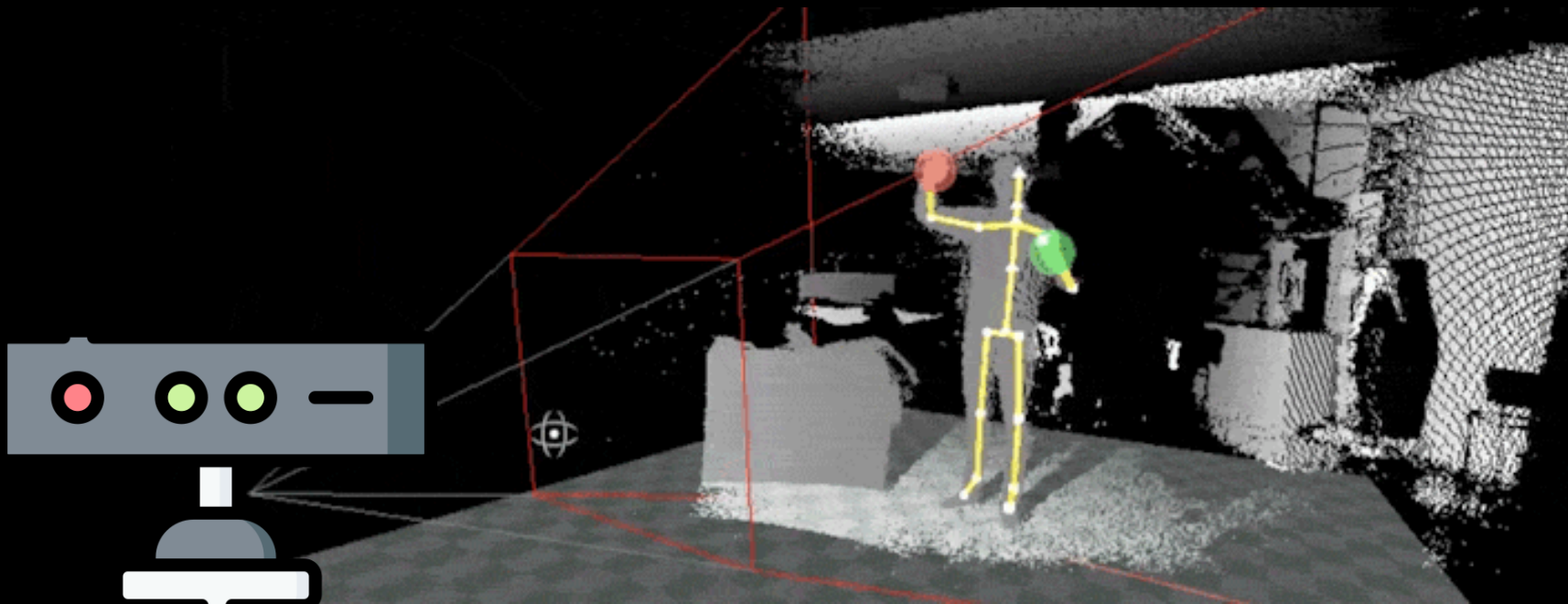
Kinect - Microsoft

Sensoriamento 3D por laser



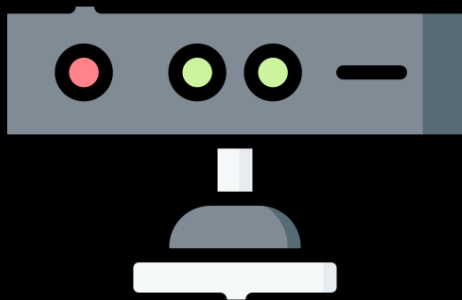
Kinect - Microsoft

Sensoriamento 3D por laser



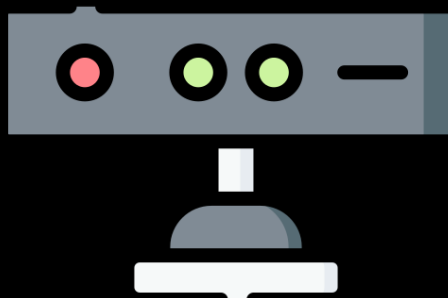
Kinect - Microsoft

Sensoriamento 3D por laser



Kinect - Microsoft

Sensoriamento 3D por laser



Depth Map

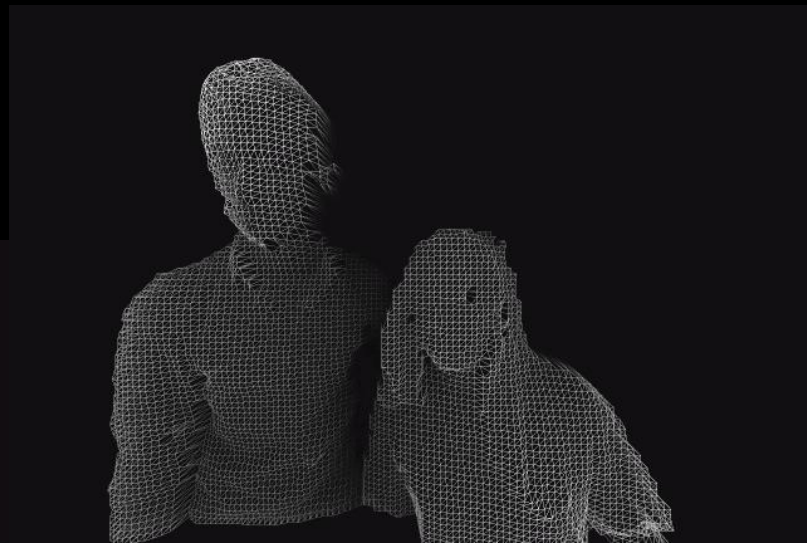


3D Reconstruction



Kinect - Microsoft

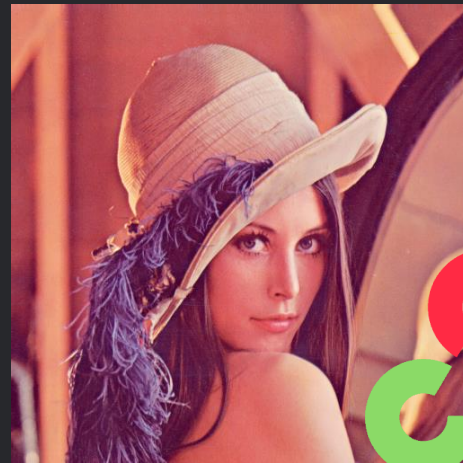
Sensoriamento 3D por laser



Obrigado!

Machine Learning

Prof. Dr. Diego Bruno



OpenCV