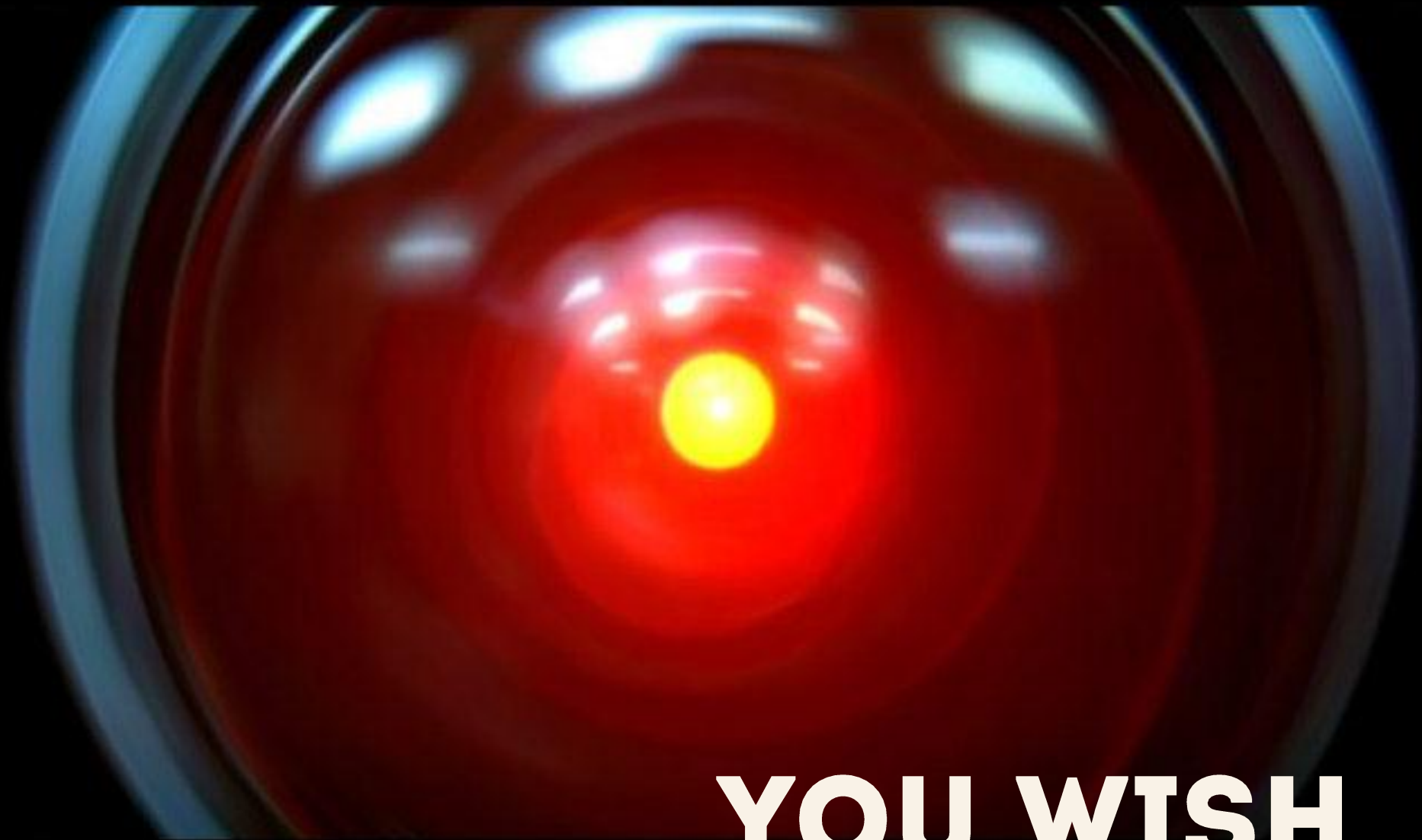


# RECOGNIZING ONGOING HUMAN ACTIONS WITH THE HELP OF



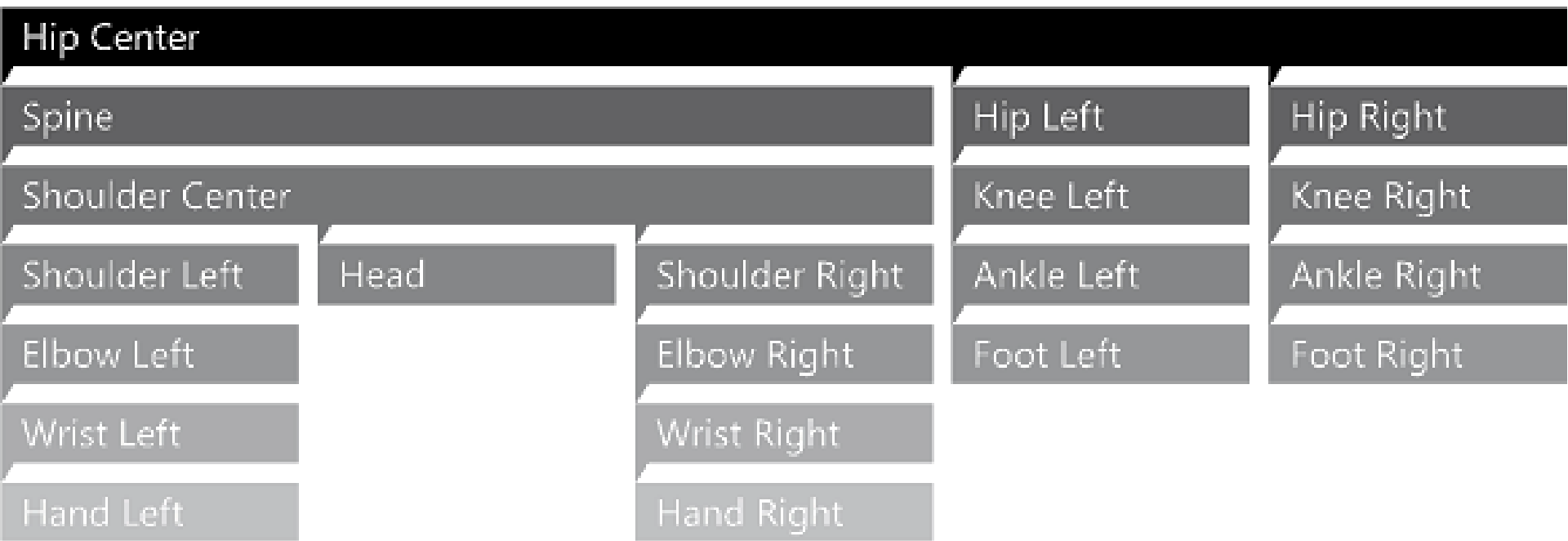
**LYUBOMIR YANCHEV**  
**YANCHEV.LYUBOMIR@GMAIL.COM**



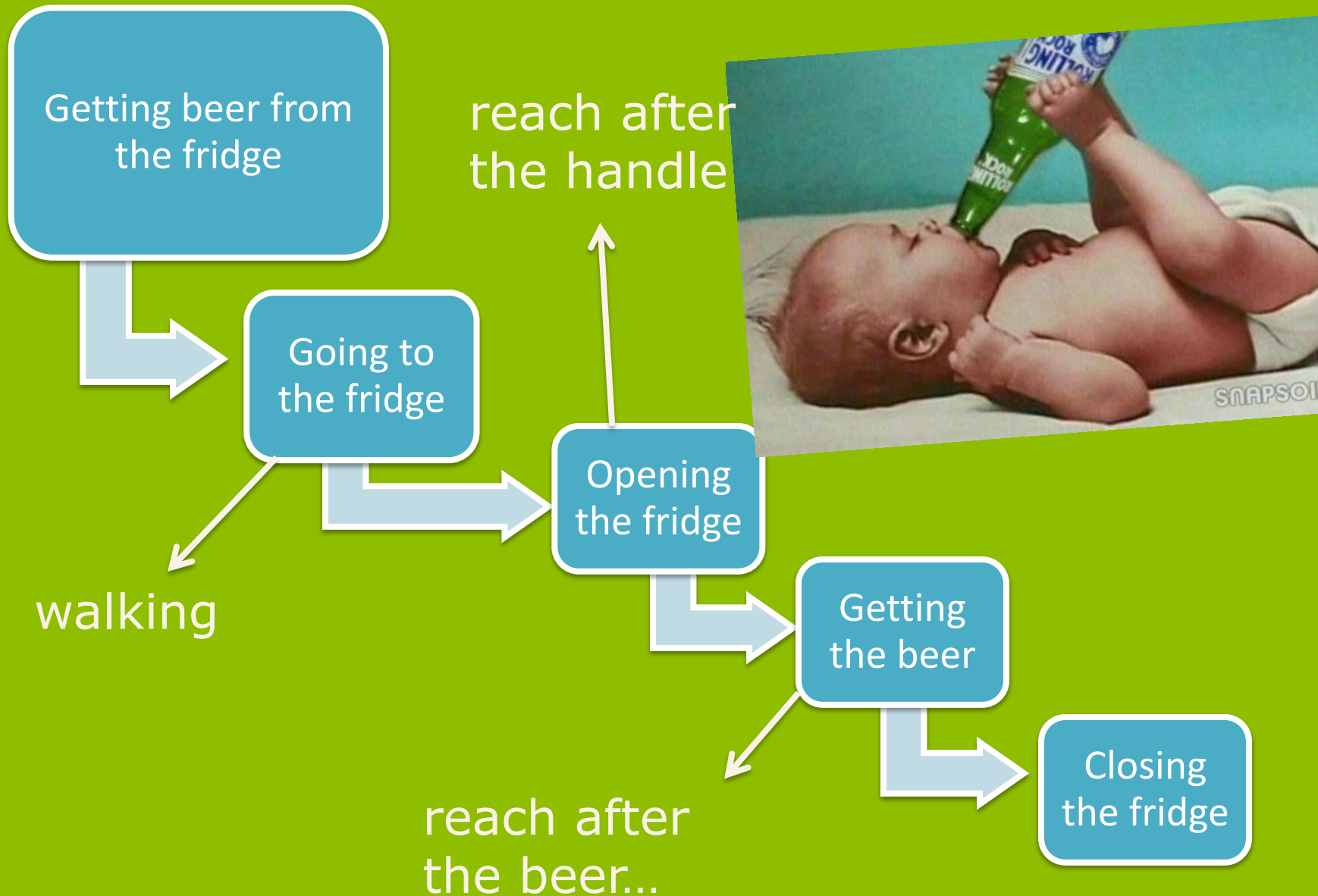
**YOU WISH..**

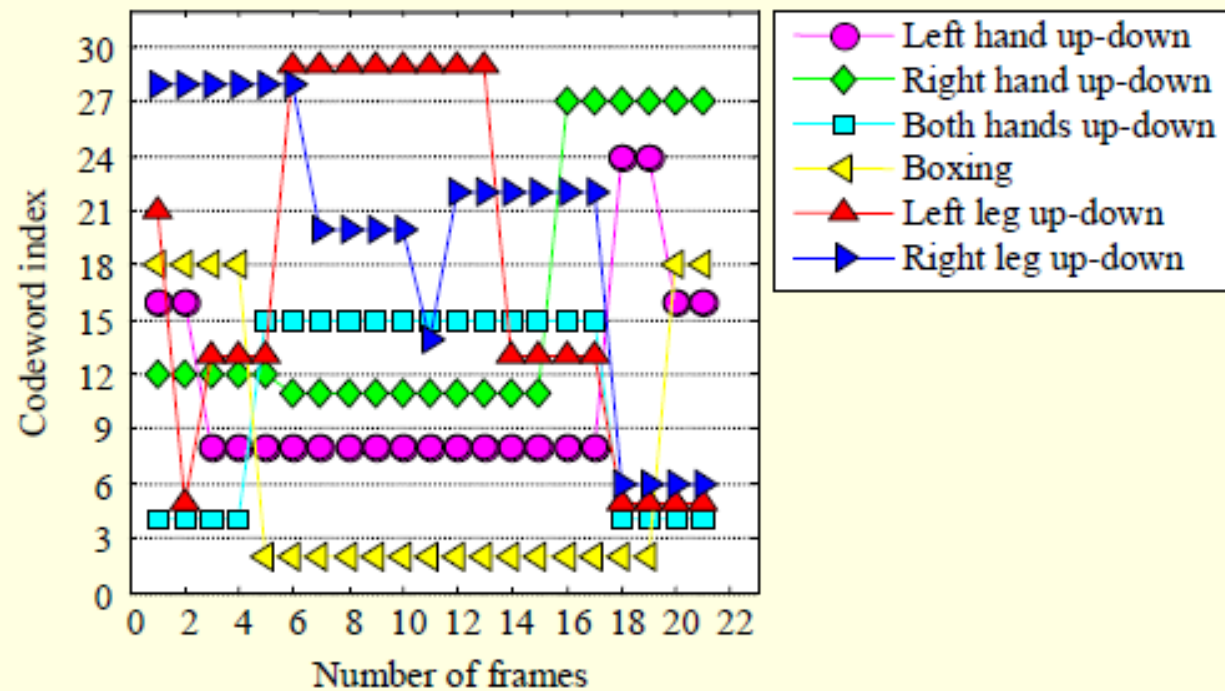






# WHAT IS A HUMAN ACTION?!





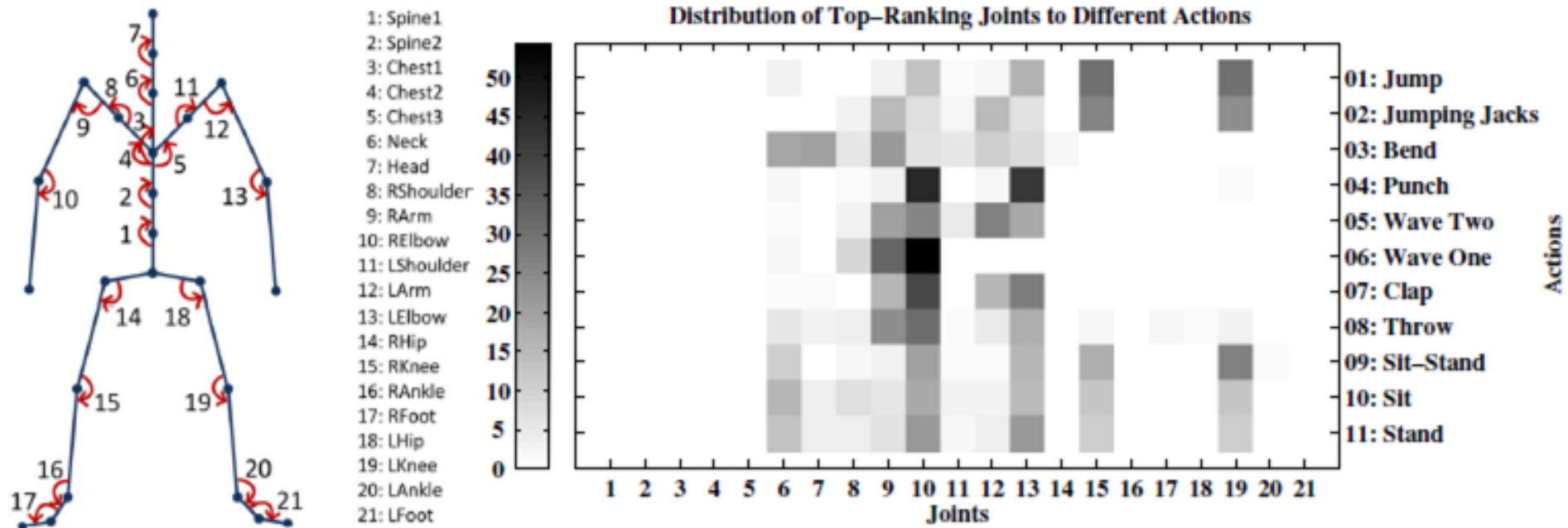
# WHAT BENEFITS THE HUMAN ACTION RECOGNITION?

**THANKS,  
SKELLY!**



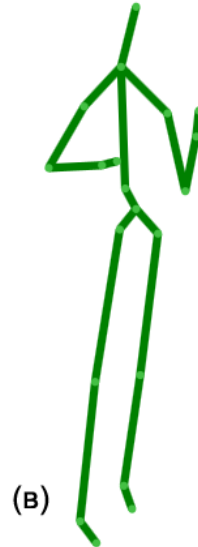
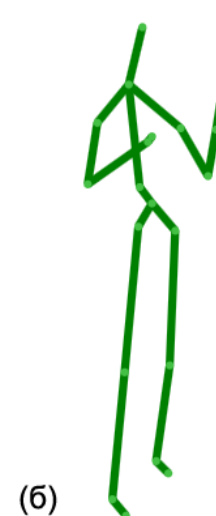
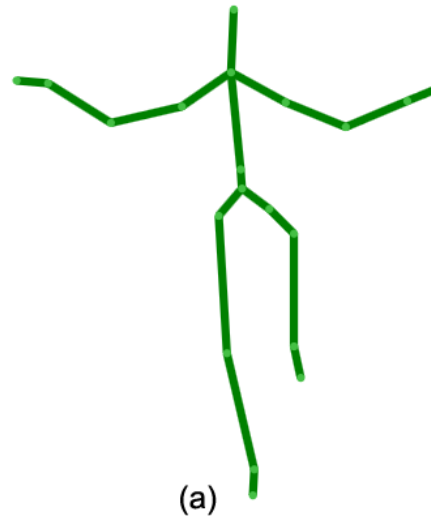
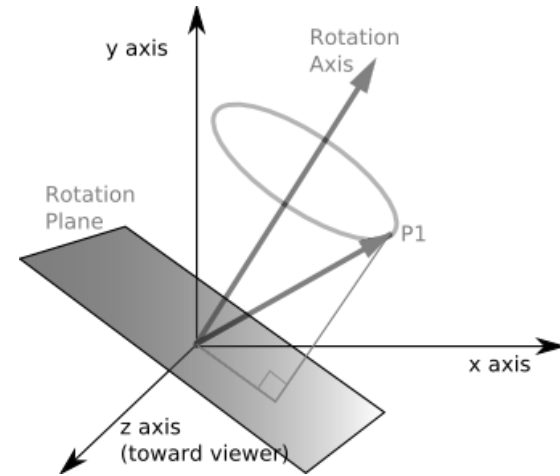


# SEQUENCE OF THE MOST INFORMATIVE JOINTS



# CALCULATIONS... **BURN!**

- Compare joints
  - Quaterions... anyone?
    - $\cos \alpha = R_x * S_x + R_y * S_y + R_z * S_z + R_w * S_w$
    - $(R_x - S_x)^2 + (R_y - S_y)^2 + (R_z - S_z)^2 + (R_w - S_w)^2$
- Compare skeletons
  - Okay, that shouldn't be so hard...
- Compare actions?!



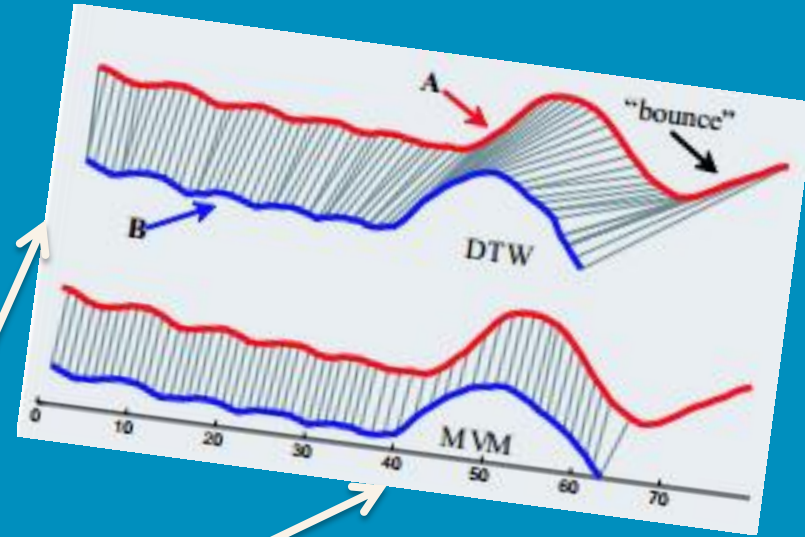
# HOW DO WE COMPARE ACTIONS?

**HIDDEN MARKOV MODELS**  
USED MOST COMMONLY

**DYNAMIC TIME WARPING**  
AAH?

**ELASTIC MATCHING**  
?!

**NEURAL NETWORKS**  
THEY'RE "OK" FOR EVERYTHING



# DEMONSTRATION

AT LAST...

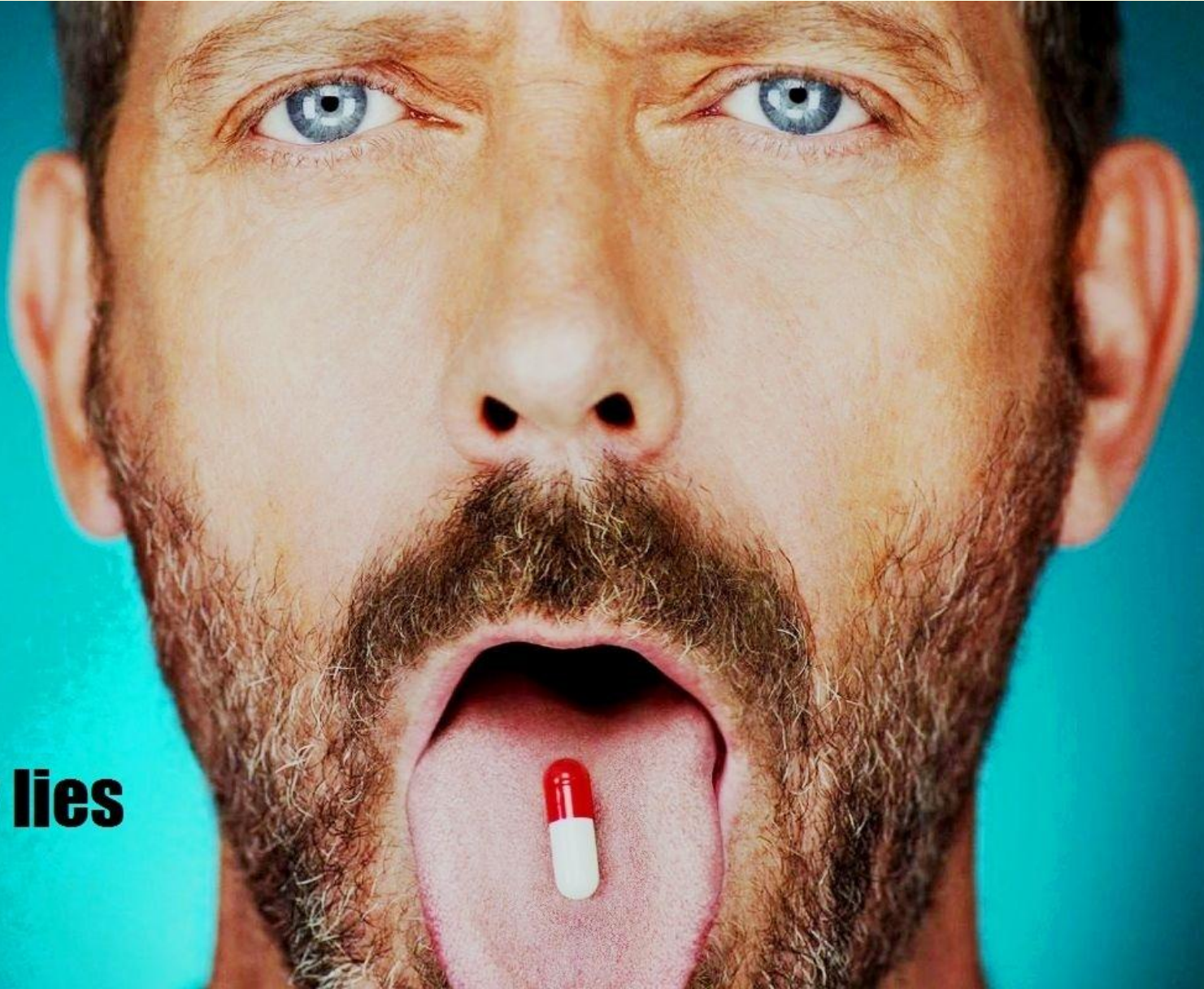


**BUT WHERE?**



# MEDICINE

**everybody lies**





# VIDEO SURVEILLANCE



# NATURAL USER INTERFACE



# USED LITERATURE... **NOT ALL OF THEM**

- A Method For Human Action Recognition (*Osama Masoud and Nikos Papanikolopoulos*)
- Qualitative Recognition of Ongoing Human Action Sequences (*Yasuo Kuniyoshi, Hirochika Inoue*)
- Human Action Recognition from Boosted Pose Estimation (*Li Wang, Li Cheng*)
- Action Recognition Based on A Bag of 3D Points (*Wanqing Li, Zhengyou Zhang, Zicheng Liu*)
- Human Activity Recognition Using Body Joint-Angle Features and Hidden Markov Model (*Md. Zia Uddin, Nguyen Duc Thang, Jeong Tai Kim, and Tae-Seong Kim*)
- Distributed Recognition of Human Actions Using Wearable Motion Sensor Networks (*Allen Y. Yang , Roozbeh Jafari, S. Shankar Sastry and Ruzena Bajcsy*)
- Evaluation of local spatio-temporal features for action recognition (*Heng Wang, Muhammad Muneeb , Alexander Kläser, Ivan Laptev, Cordelia Schmid*)
- Human action recognition with pose similarity (*Shiquan Wang, Kaiqi Huang, Tieniu Tan*)
- Sequence of the Most Informative Joints (SMIJ): A New Representation for Human Skeletal Action Recognition (*Ferda Ofli, Rizwan Chaudhry, Gregorij Kurillo, Ren'e Vidal and Ruzena Bajcsy*)
- Activity Recognition Using a Combination of Category Components and Local Models for Video Surveillance (*Weiyao Lin, Ming-Ting Sun, Radha Poovendran, Zhengyou Zhang*)
- Expandable Data-Driven Graphical Modeling of Human Actions Based on Salient Postures (*Wanqing Li, Zhengyou Zhang, Zicheng Liu*)
- Does Human Action Recognition Benefit from Pose Estimation? (*Angela Yao, Juergen Gall, Gabriele Fanelli, Luc Van Gool*)

# THANKS!

**FEEL FREE TO GET IN  
TOUCH WITH ME!**



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