**Some proposed project topics:**

**Coding can be done in any programming language and any environment you prefer**

1. (Motion Compression) Choose three different MoCap compression techniques, implement them (if the code is not already available) and compare them together.
2. (Motion Compression) Try DFT, DCT and Wavelet transform on MoCap data. See if any feature can be detected when you change the domain. Also apply entropy coding techniques (Huffman, RLC and Arithmatic coding) and PCA for compression. Compare them and see which one gives a better compression ratio.
3. (Motion Generation) Giving a set of motion capture files and different human models, use 3ds max or blender to import the motion captures from character A to a new character B. Export the retargeted motion and save it as a new motion file. Also change the trajectory of different motion using graph editor in 3ds max or blender. Again save the changed motion as a new motion file. Apply PCA on the generated motion and the original motion and check if both of them present the same feature.
4. (Motion Generation) Compare Barycentric, Radial Basis Function, K Nearest Neighbour, Inverse Blending, Style based Inverse Kinematics and Geostatistical Motion Interpolation Blending techniques for motion generation. Compared the method based on smoothness as explained in “an analysis of motion blendinh techniques”. (Part of the code is available)
5. (Motion Evaluation) Build a framework to perceptually compare motion, (it should give the user the option to compare two skeletal animation or two 3d model animation). For the model animation the skeleton should embed into the skeleton and the model should be rigged. (Part of the code is available.)
6. (Motion Evaluation) Giving a set of motion capture files, translate the motion into new motions using the technique presented in the paper “styles translation for human animation”. Then apply the motion into some 3d characters in 3ds max or blender. Also evaluate the generated motion based on the factors presented in “evaluating motion graphs for character animation”. (Part of the code is available.)
7. (Motion Segmentation) Giving a set of MoCap files, segment the data into distinct behavior using the graph cut method, PCA and Gaussian Mixture Model. Compare the result of segmentation. (Part of the code is available.)
8. (Motion Segmentation) Giving a set of MoCap files, perform temporal segmentation for human motion using aligned cluster analysis. Improve the method and compare the result with PCA and graph cut segmentation.
9. (Clothes Animation) Implement a virtual fitting approach such as “Image based clothes animation for virtual fitting”. (you may need to use a device like Kinect, I might be able to give you a Kinect, I am not sure though)