IV. Discussion

The trained CMAC can now be used for testing in a real prototype for a transfemoral active prosthesis. The advantage is that it is easily implemented in embedded systems. It requires only simple tables and calculations. Maybe more data is required, but a tool for training the CMAC is already done.

Others joints (hip, anckles) and order degree of freedoms can be simulated too. It is necessary however, to collect data from the other joints and calculate new angles, velocities and accelerations (using the same implemented methods), which isn't done yet. Motus is a working in progress.

V. Conclusions

The development of a transfemoral active prosthesis requires building control systems. These systems should be implemented as embedded systems, which typically have limited computing power. ANNs can be used for building control systems, but ANNs require a process called training. This usually requires a high computational power and is best accomplished in desktop systems or computers clusters.

This paper has shown the simulation approximation of a signal relating to a knee angular velocity, based on contralateral knee signals. All this simulation was performed using a CMAC, a type of ANN, which showed very good results graphically.

Besides the simulation, all necessary code to build and train the CMAC and also to simulate signals is available as open source. This project is on GitHub site and is accessible to anyone. The same is under continuous development.

VI. Acknowledgments

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VII. Conflict of Interests

The authors declare that they have no conflict of interest.

VIII. References

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