10 Week M-Station Training Program Increase Speed With Ball by 29% and Significantly Improve Ball Control for 14 Year Old Soccer Player

By Peter Kjeldsen and Christian Kjeldsen

Christian Kjeldsen was born 14 years ago with a mild case of cerebral paresis. Like many other kids he enjoys playing soccer - but the cerebral paresis means that he has faced special challenges. Through strong determination and tireless training he has been able to mitigate the effects from the handicap he was born with. This article describes some remarkable results that he achieved over a 10 week period using the Munin Sports M-Station Talent - including a 29% increase in speed with the ball and significantly improved technical skills.

Background

Christian has received special training from occupational therapists since he was an infant. He started playing soccer at age five, and except from a one year break when he was around seven he has played soccer ever since. Christian's left side has always been weaker than his right side due to his cerebral paresis, which meant that he couldn't run as fast as the other kids - at age 9 his speed in a 850m run was about 67% of the average speed of other kids. The cerebral paresis also meant that he couldn't kick the ball as hard as the other kids, had more difficulties keeping his balance and was in general at a physical disadvantage - despite training twice a week as the other kids in the soccer club.

A focused approach was taken to improve Christian's running speed. Around age 10 he began developing the cross-coordination of his arms and legs using a cross-trainer. When he was 12 he started using a treadmill, and gradually began using interval training to boost his speed. At age 14 he can now run 10 km in less than 55 minutes, and his capability to keep up with the other players in a soccer match has been dramatically improved. However, balance and ball-control remains to be challenging areas for him.

After trying the Munin Sports M-Station Talent in his local soccer club in the spring of 2014 it was clear that there could be a great potential benefit for Christian in using this device on a daily basis in our own garden.

An arrangement was made where Munin Sports offered a discount on an M-station in return for documentation of whatever results that Christian would achieve by using the M-Station. This article is the documentation that came out of this.

Training Program

Christian received the M-Station in June 2014, and used the first few months to get acquainted with the device and to build basic skills with it. At first, even bouncing the balls a few times without it hitting the ground was a challenge. However, by September his skills had improved to the point where a structured training program made sense.

The program consisted of three different exercises, that each was repeated a number of times:

- Exercise 1 "Juggling with feet": In this exercise the M-Station was set to position 8, and Christian used his feet to juggle/bounce the ball against the M-Station. The exercise was repeated five times in one training session.

- Exercise 2 "Juggling with head": In this exercise the M-Station was set to position 11, and Christian used his head to juggle/bounce the ball against the M-Station. The exercise was repeated five times in one training session.

- Exercise 3 "Dribble". In this exercise the M-Station was set to the vertical ("-") position. The "Dribble" function in the iPhone app for the M-Station was used with settings describing the zig-zag layout of the dribbling exercise: 10 meter, 6 cones, 5 laps. This exercise was repeated three times in one training session.

Over a period of 10 weeks Christian completed 50 training sessions, corresponding to 5 sessions per week. The time spend on one session was about 20-25

minutes in total. All results were written down and analyzed in Excel.

Results of 10 Weeks of Training

The top chart of Figure 1 shows the average number of bounces (averaged over 5 repetitions) achieved with Exercise 1, Juggling w/Feet. The orange line is a trend line added by Excel using linear regression. The value of the trend line at the beginning and the end of the 10 weeks training period shows a 4.5 times increase in the average number of bounces achieved. Given that each data point represents an average over 5 repetitions, and that the linear regression also eliminates daily fluctuations, the 4.5 times improvement is a solid measure of the progress made over the 10 week period.
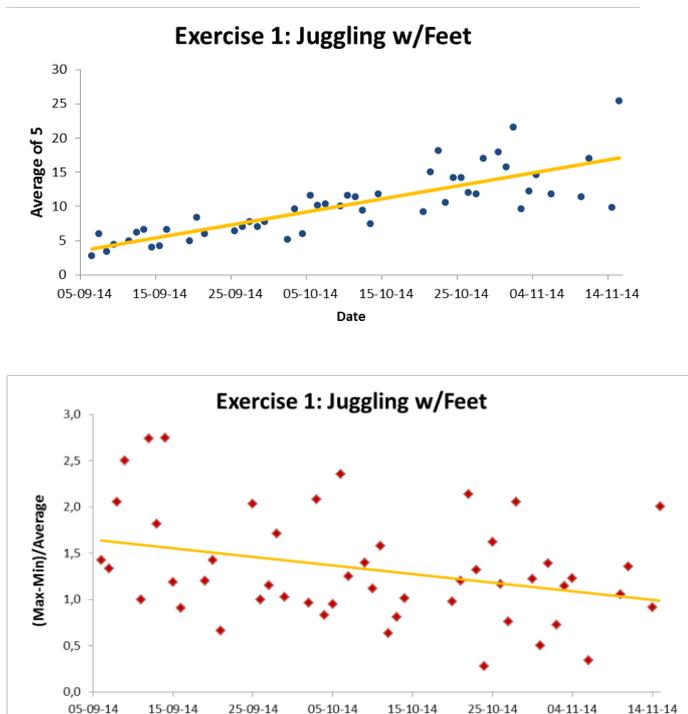

Figure 1: 4.5x increase in average repetitions with feet (top chart), and 40% decrease in variation of results (bottom chart).

However, there is more to say about the progress, as illustrated by the lower chart of Figure 1, which shows how the variation of the results changed over time. The variation of any given days results was calculated as the difference between the highest value and the lowest value divided by the average value. The lower chart in Figure 1 also incorporates a trend line based on linear regression, and based on this trend line the variation in the achieved results for Exercise 1 decreased by 40% over the 10 week period. When viewed together, it is clear that the increase in

average bounces combined with the decrease in the variation of the results represents strong evidence of a significantly improved ball control.

The results from Exercise 2, Juggling w/Head are shown in Figure 2, and they show similar results as seen for Exercise 1. Over the 10 week period the average bounces achieved were increased 6.3 times, while the variation of the results was reduced by 35%. Again it is clear that the ball control was significantly improved over the 10 weeks of training.
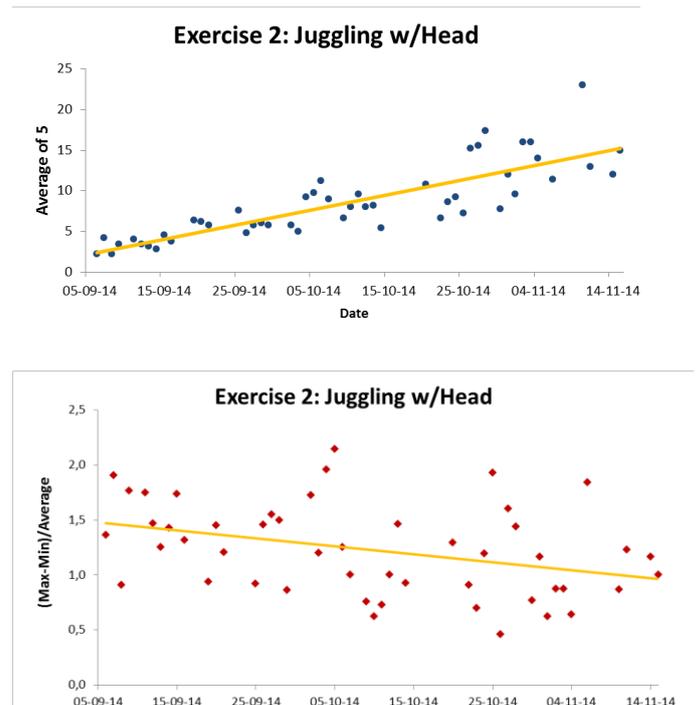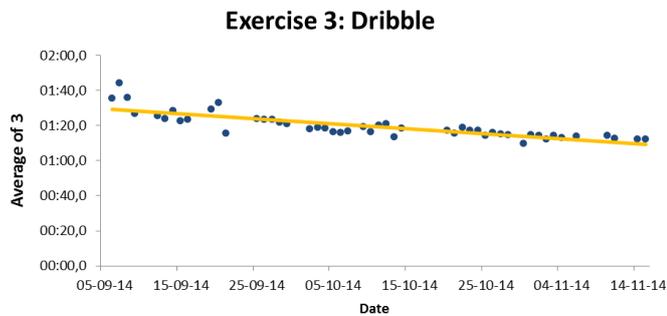

Figure 2: 6.3x increase in average repetitions with head (top chart), and 35% decrease in variation of results (bottom chart).

The results from Exercise 3, Dribble, is shown in Figure 3, where the top chart shows the average time measured over 3 repetitions of the exercise, while the lower part shows the variation of the results. The orange trend lines (again based on linear regression) show that Christian speed with the ball increased by 29% during the 10 week period, and the variation in the times decreased by 52% over the same period. Seen together, these results clearly demonstrate a significant improvement in Christian's speed with the ball.

Figure 3: 29% increase in speed with ball (top chart), and 52% decrease in variation of results (bottom chart).

Christian's Experience

The results presented above are very encouraging when seen in isolation, but the perhaps most important impact from the 10 week program is that Christian clearly takes advantage of his improved ball control and speed with the ball when he plays soccer.

He feels more confident receiving the ball from his team mates, and experience an improved balance and calmness when we takes possession of the ball which allows him to provide better passes to his team mates. And his improved heading skills also come in handy as he fights for the ball from his usual position as a defensive midfielder.

As a side note, Christian's motoric challenges have in the past prevented him from training his technical skills doing "keepie uppies" (aka "kick-ups"), as starting the juggling with the ball was too challenging for him. His personal record to date in juggling/bouncing with his feet (Exercise 1) is now 58. The M-Station has enabled him to enjoy this playful aspect of soccer training, which his handicap previously prevented him from experiencing.

Conclusion and Perspective

In conclusion, the results achieved over the 10 weeks of training has been impressive, and Christian will certainly continue to use the M-Station in the future to further assist the development of his agility and ball control.

Having experienced the very positive impact on Christian, it is our belief that the M-Station could have general use in training of people with physical disabilities. Two features of the M-Station is worth emphasizing in this context: 1) It is easy to adapt and improvise so that the exercises of the M-Station can match the physical condition of the person using it and 2) bouncing a ball is something that most people find funny – especially when it goes BOING! as it bounces back – and you need daily fun to keep the motivation high as you follow a training program that lasts months or even years.

So while the M-Station clearly is a good way for skilled players to further hone their technical abilities, it is equally well suited to help more challenged players getting a foot in the game. And that is a genuine pleasure to experience.

We would like to thank Munin Sports for the collaboration around this. And we would like to stress that we do not have any commercial interest in Munin Sports. The discount that we agreed with Munin Sports was agreed upfront, and it was not dependen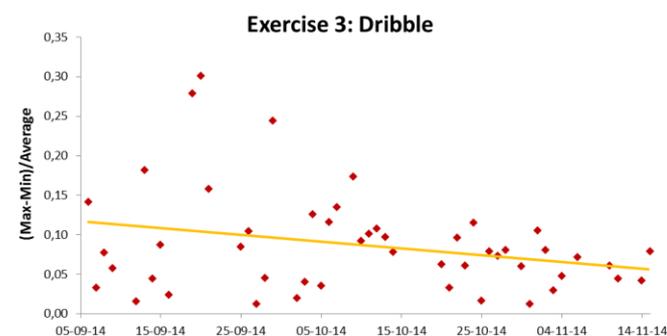t on what our experience with the M-Station would be.