



Swimming Performance Analysis

TEMPLO Swimming Performance Analysis is a complete solution for analysing the biomechanics of swimming movements and performance relevant parameters divided in specific workflows:

- *Start Analysis*
- *Turn Analysis*
- *Timing Analysis*
- *Competition Analysis*
- *Qualitative Motion & Technique Analysis*





Markets

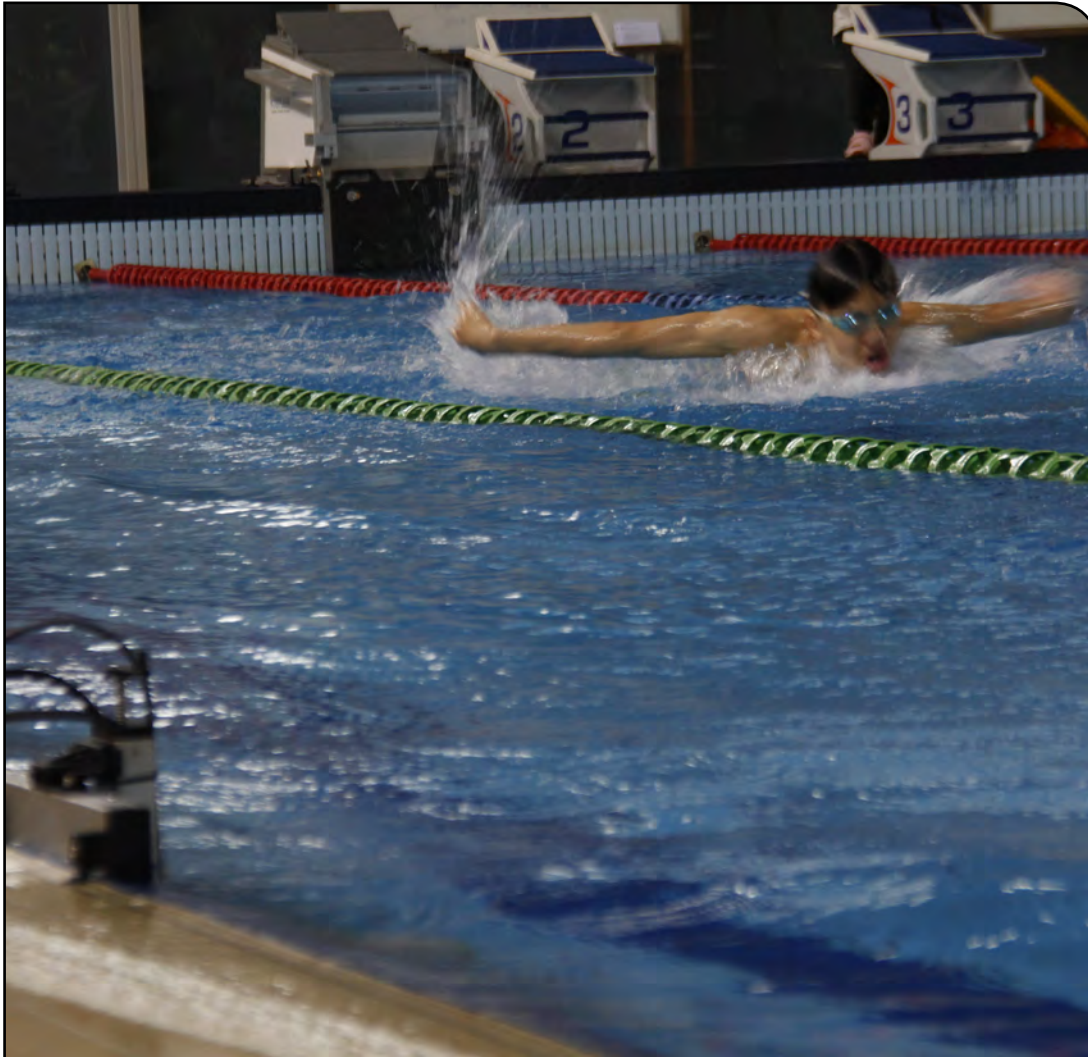
- + Olympic training centers
- + Sport federations
- + Sport clubs
- + Biomechanic labs
- + Universities
- + Personal trainers

Purpose

- + Performance analysis
- + Kinetic and kinematic documentation
- + Demand to record and play back
- + Feedback training
- + Research & teaching

Software Philosophy

- + Easy to use
- + Instant live view
- + Instant feedback
- + Portability
- + Serves coach's and sports scientist's needs
- + Easy to read automatic reports

HONG KONG SPORTS INSTITUTE
Hongkong(HK)**TOP Reference****SETUP**

- 6 PTZ Cameras
- 6 fixed under water cameras
- 6 fixed above water cameras for timing analysis on truss
- 4 mobile under water cameras
- 1 mobile above water camera for start analysis
- Instrumented Start Block
- Mobile trolley with 2 camera wireless system (1 AW, 1 UW camera)
- Wireless remote control via Tablet

PURPOSE

- Start & Turn Analysis
- Timing Analysis
- Technique Analysis
- Feedback training

<http://www.hksi.org.hk/>

Flemish Swimming Federation
Antwerp (BE)**TOP Reference****SETUP**

- 3 fixed above water cameras
- 7 fixed under water cameras
- Wireless remote control via tablet
- OMEGA start & timing synchronization
- Birdseye view
- TEMPLOServer with 4 Analysis stations

PURPOSE

- Start Analysis
- Timing Analysis
- Feedback training
- Technique Analysis
- 5 years partnership with Flemish Swimming Federation

<http://www.zwemfed.be>

Olympic Training Center Berlin
Berlin(DE)**TOP Reference****SETUP**

- 7 fixed above water cameras
- 4 fixed under water cameras
- 2 mobile under water cameras
- OMEGA start & timing synchronization
- Wireless remote control via tablet
- TEMPLOServer system with 2 analysis stations

PURPOSE

- Start Analysis
- Turn Analysis
- Timing Analysis
- Feedback training
- Technique Analysis

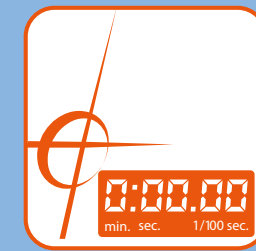
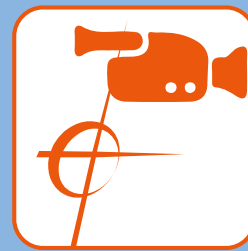
Reference list Swimming Performance Analysis

- Hong Kong Sports Institute, HongKong
- Flemish Swimming Federation, Belgium
- Olympic Training Center Berlin, Germany
- Olympic Training Center Sachsen- Anhalt, Germany
- Singapore Sports Hub, Singnapore
- Gloria Sports Arena, Turkey
- NRW Swimming Federation, Germany
- Sportschule Lindow, Germany
- Olympic Training Center Rhein- Ruhr, Germany
- Olomuc University, Poland

... many more



Focus on START ANALYSIS



Swimming Performance Analysis

Cameras

Measurement devices

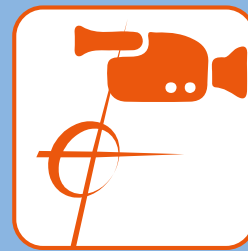
- Reaction time
 - Time on block
 - Flight time
 - Split times
 - Diving depth
 - Distance of emerge
 - Immediate feedback
 - Video analysis & measurement tools
- Min. 5 camera setup (4 UW, 1AW)
 - Additional camera positions available
- Instrumented start blocks
 - OMEGA synch
 - ALGE synch
 - EMG
 - Analog devices



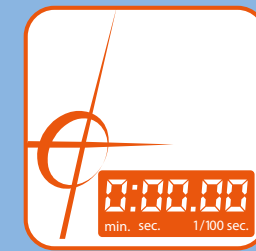
Focus on TURN ANALYSIS



Swimming Performance Analysis



Cameras



Measurement devices

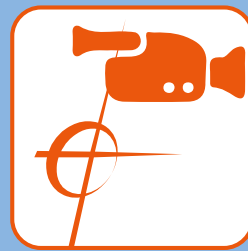
- Split times fore and after turns
 - Push time
 - Diving depth and distance
 - Immediate feedback
 - Video analysis & measurement tools
- Min. 5 camera setup (4 UW, 1AW)
 - Additional camera positions available
- Force measurement with instrumented turn platforms
 - OMEGA synch
 - ALGE synch
 - EMG
 - Analog sensors



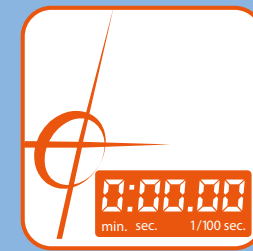
Focus on TIMING



Swimming Performance Analysis



Cameras



Measurement devices

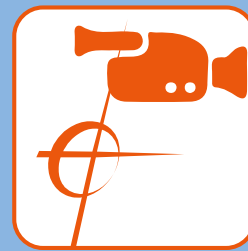
- Split time analysis
 - Stroke rate analysis
 - Automatic split time report
 - Intelligent definition of points in time
 - Distance of emerge
- 5 camera setup above water
 - Additional perspectives available
- OMEGA synch
 - ALGE synch
 - Instrumented start blocks
 - Other analog devices



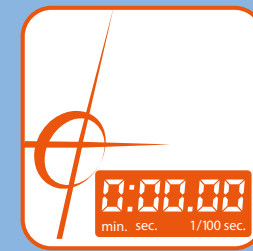
Focus on *COMPETITION*



Swimming Performance Analysis



Cameras



Timing

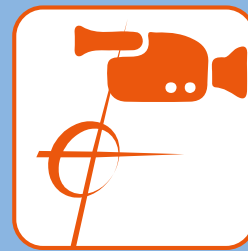
- Split time analysis
 - Stroke rate analysis
 - Automatic split time report
 - Intelligent definition of points in time
 - Distance of emerge
- 1 mobile camera setup
- For competitions



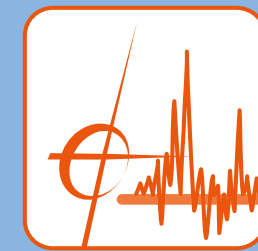
Focus on QUALITATIVE MOTION & TECHNIQUE ANALYSIS



Swimming Performance Analysis



Cameras



EMG (optional)

- Overlay
- Competition of different
-athletes
-trials of one athlete
- Video report
- Delayed live view
- Graphic tools
- Measurement tools (angles, distances)

- Mobile underwater system
- More than 1 camera
- Waterproofing housings
- Mobile trolleys for transportation and storage
- Notebook/desktop applications
- PoE power supply
- Individual pool rim mounts

- Cometa systems
- Acquisition of EMG signal above and underwater with a fully waterproof coating
- Basic filter algorithms



Highspeed

- Set frame
- Set resolution and
Area Of Interest (AOI)
- Control all camera features
in the software

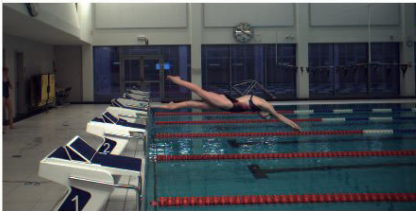
Keyfeature: Synchronized recordings of multiple perspectives

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Swimming Performance Analysis


- Start
- Settings
- Database
- Analysis
 - Recording
 - Create recording
 - Connect remote control
 - All recordings**
 - Export
 - 1 video view
 - 2 video views
 - 4 video views
 - 6 video views
 - Results Start
 - Report
 - Close trial

Schmetterling - 50 m -

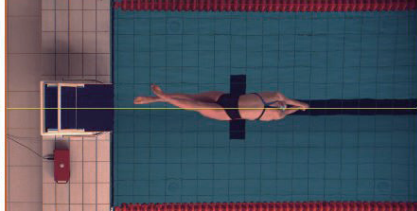
Schmetterling - 50 m -



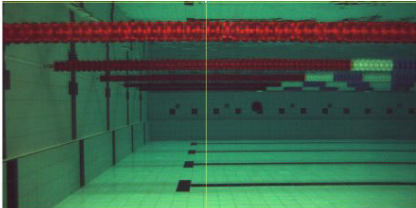
Schmetterling - 50 m -



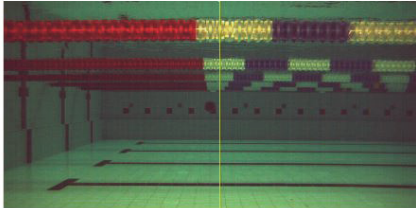
Schmetterling - 50 m -



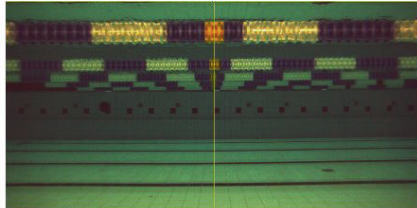
Schmetterling - 50 m -

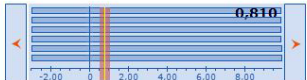








Schmetterling - 50 m -





Schmetterling - 50 m -









Pen color

Fill color

Pen color

Fill color


Pen color

Fill color

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professional motion analysis software

Swimming analysis

Stopwatch



0.00

0.17

0.71

1.01

1.76

3.15

4.80

8.27

Points in time

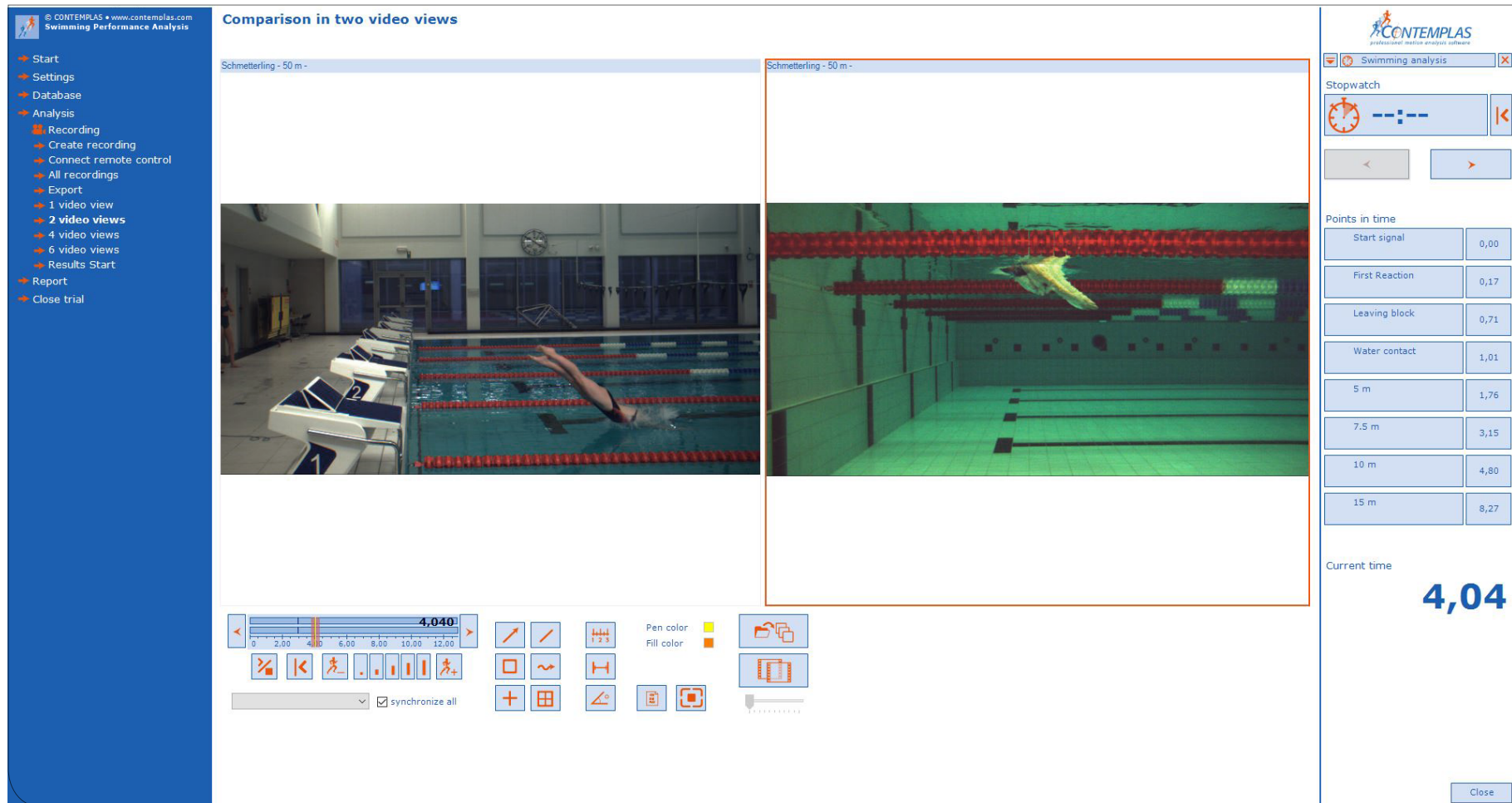
Start signal	0,00
First Reaction	0,17
Leaving block	0,71
Water contact	1,01
5 m	1,76
7.5 m	3,15
10 m	4,80
15 m	8,27

Current time

0,81

Close

Keyfeature: Above- and underwater view




Keyfeature: Easy comparison of different athletes

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Swimming Performance Analysis


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 - 2 video views**
 - 4 video views
 - 6 video views
 - Results Start
- Report
- Close trial

Comparison in two video views

Schmetterling - 50 m -



16/02/2016 8:24:21: Sebastien De Meulemeester



0,730

Pen color ■
Fill color ■

☒ synchronize all

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professional motion analysis software

Swimming analysis

Stopwatch

Points in time

Start signal	0,00
First Reaction	0,17
Leaving block	0,71
Water contact	1,01
5 m	1,76
7,5 m	3,15
10 m	4,80
15 m	8,27

Current time

0,73

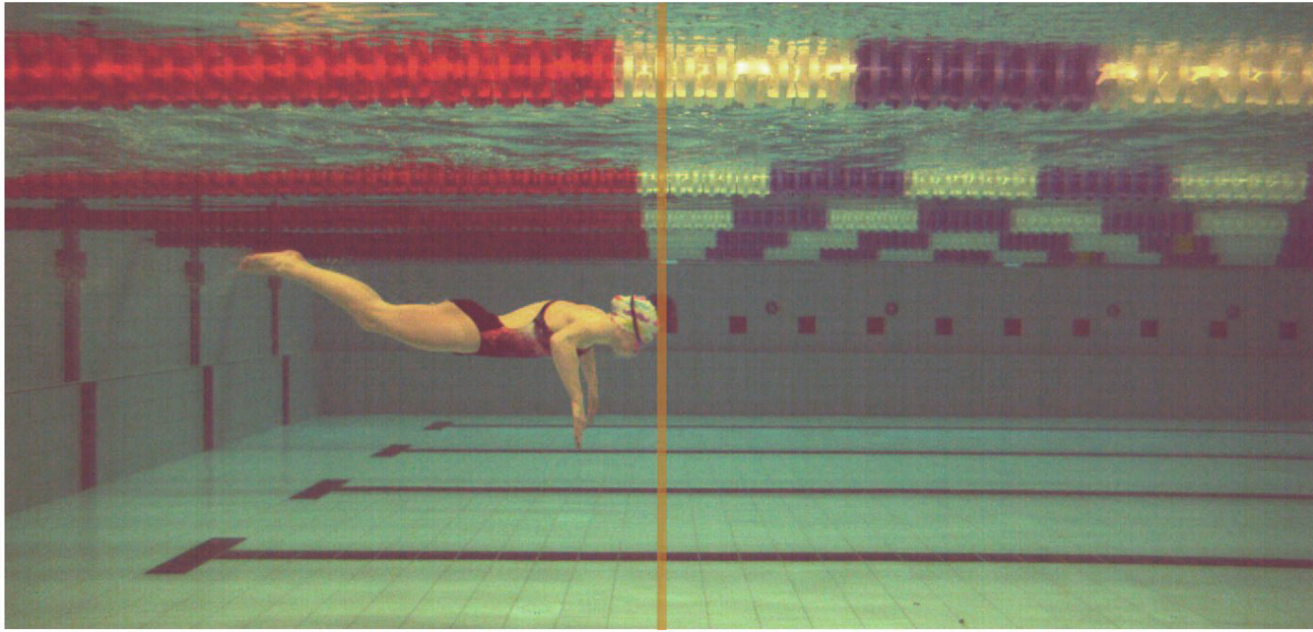
Close

Keyfeature: Easy event definition for automatic reporting

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Swimming Performance Analysis

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 - 6 video views
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 - Report
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Backstroke - 50 m -



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professional motion analysis software

Swimming: Events

Current time
13,00

Point in time
5 m

Set point in time
Assign current time

Keep point in time
Go to next point in time

Close

Keyfeature: Video analysis and measurement tools

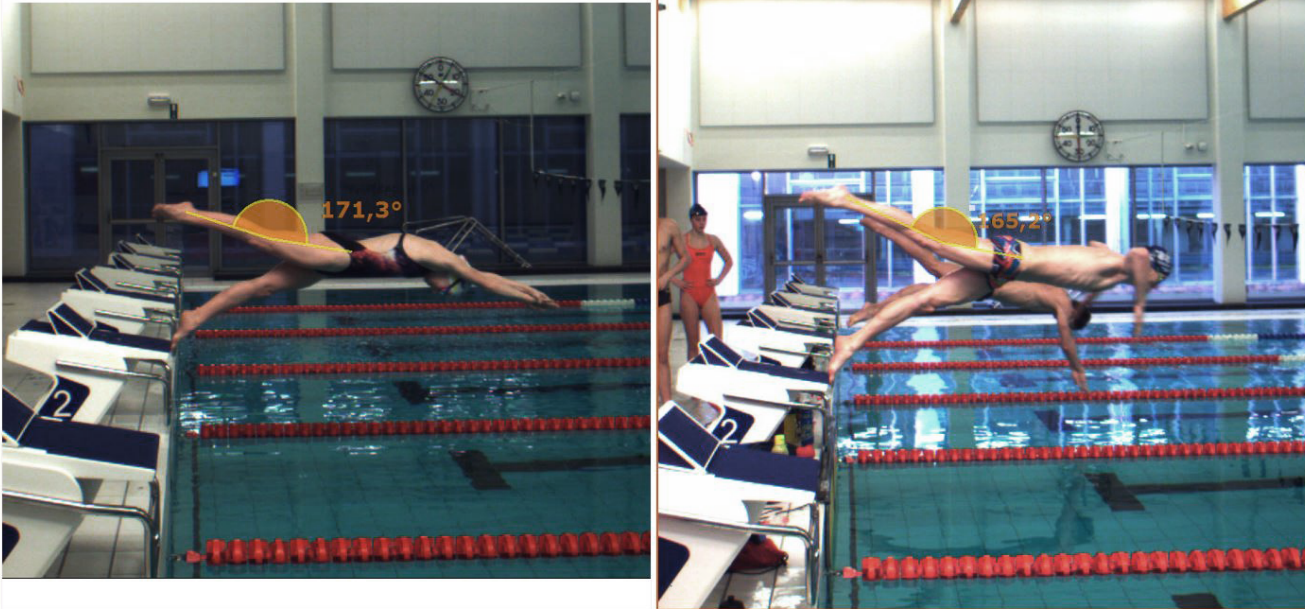
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Swimming Performance Analysis

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 - Results Start
- Report
- Close trial

Comparison in two video views

Schmetterling - 50 m -

16/02/2016 8:24:21: Sebastien De Meulemeester



0.720

Pen color ■
Fill color ■

☐ synchronize all

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Angle properties

Angle (3 points)

Name

Angle properties

☐ Counterclockwise

Zero position normal

Display properties

Line color ■

Line width 3

Segment color ■

Segment radius 46,9

Close

Keyfeature: Automatic report



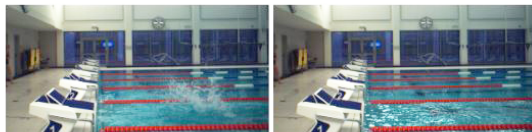
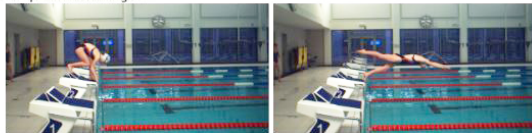
Swimming Performance Analysis
02.03.2016
Turn - Backstroke
Butterfly
50 m



Start analysis

Reaction	0,170 s
Block empty	0,710 s
Flight time	0,300 s
Split time 5m	1,760 s
Split time 7.5m	3,150 s
Split time 10m	4,800 s
Split time 15m	8,270 s
avg. velocity 0m-5m	2,8 m/s
avg. velocity 5m-10m	1,6 m/s
avg. velocity 10m-15m	1,4 m/s

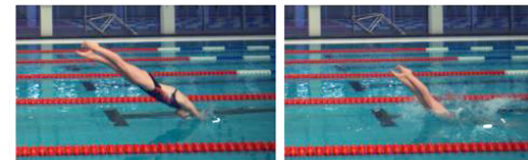
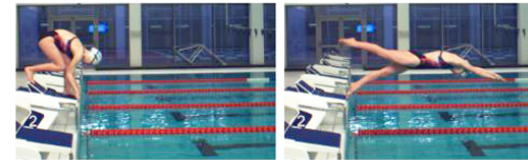
Sequence of images



Notes



Swimming: Start and Turn
Date: 02.03.2016
Start - Butterfly
Born: 01.01.1990



Results [s]:
Start: 0,00
First reaction 0,17
Leaving block 0,71
Water contact 1,01
5m split 1,76
7.5m split 3,15
10m split 4,80
15m split 8,27

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Hardware requirements



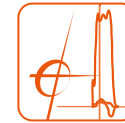
Swimming Performance Analysis



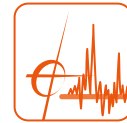
Camera



Timing



Force



EMG

Cameras

GigE



USB3.0



Measurement Devices



Instrumented starting block

ALGE
TIMING
ELECTRONIC DEVICES

Ω
OMEGA

cmeta

Accessories



Rim mount



Mobile workstation

TEMPLO remote control



Swimming Performance Analysis System - Typical Setups

