



AUSCYCLING

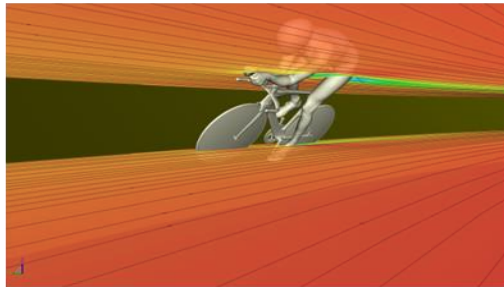
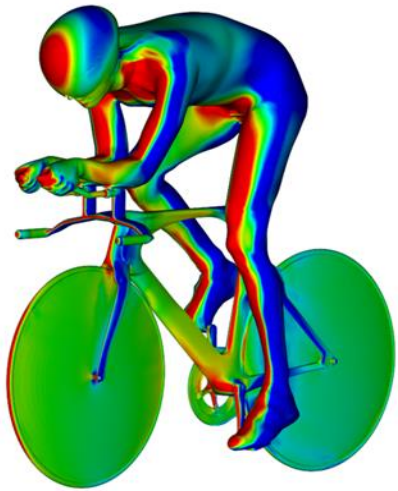
**ADELAIDE UNI
COMPUTER
SCIENCE PROJECTS**

DATE

JOHN PITMAN

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Intro

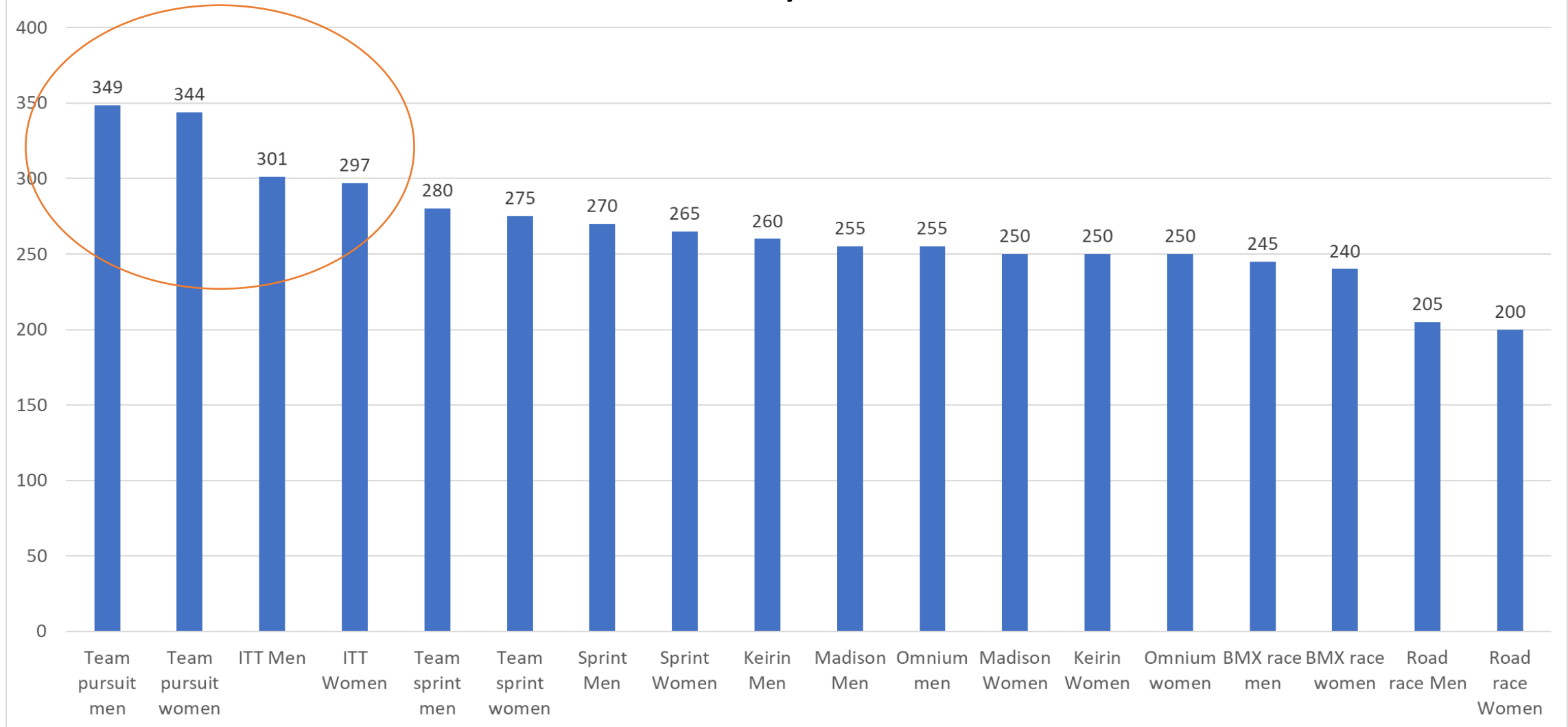


- AusCycling aero engineer since 2017
- Role has progressed to encompass performance engineering, modelling

What we do



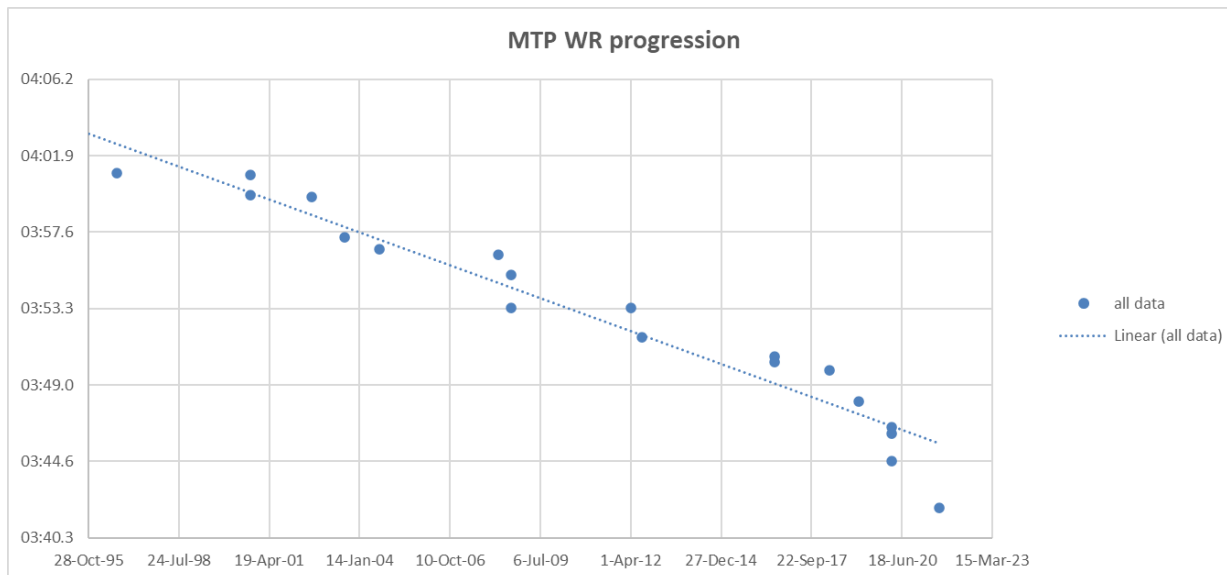
Event 'controllability' score



Project #1: Team pursuit strategy tool

Team pursuit

- 4 riders. Men, women events
- 4km, standing start
- 16 laps of 250m track
- 3 riders must finish
- Timed to the 3rd rider over the line

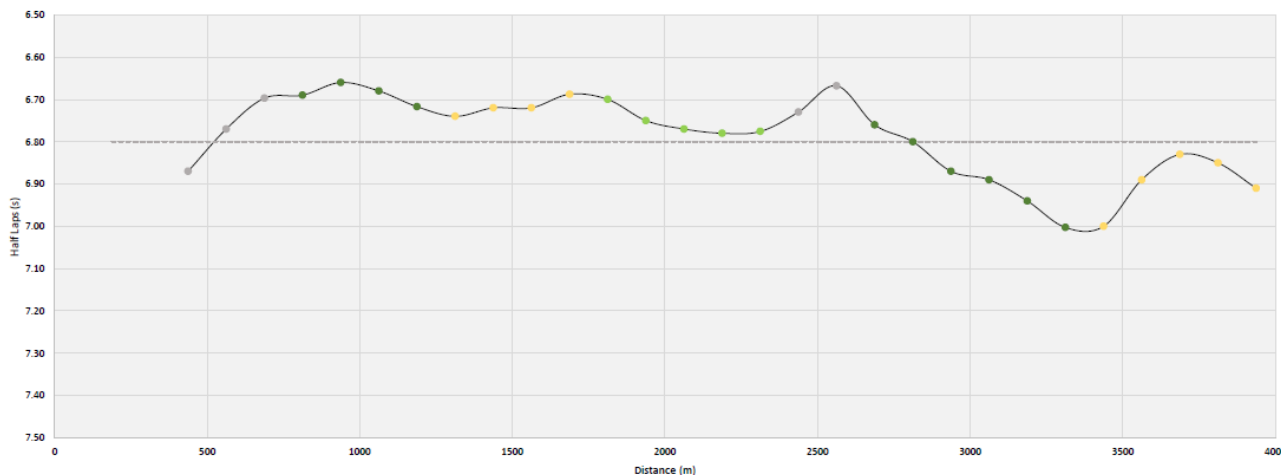
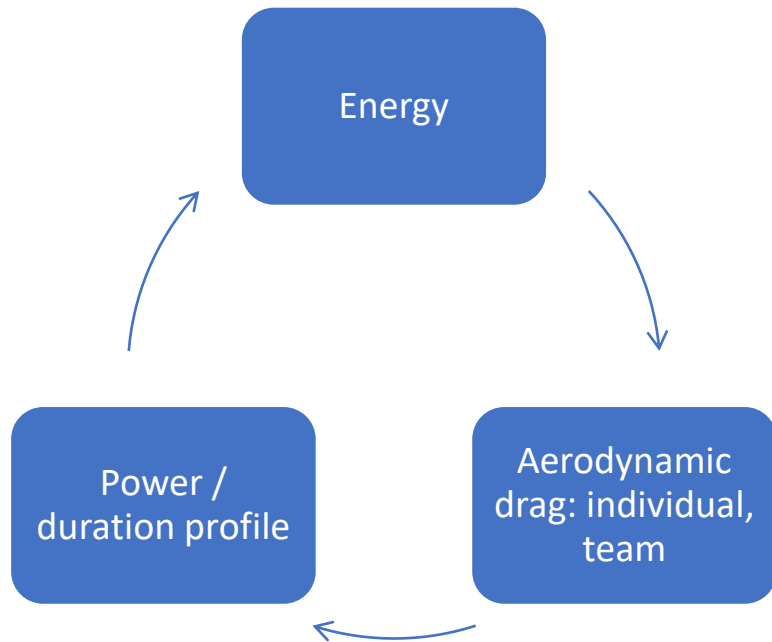


- Highly competitive
- Increasing sophistication
- Athletic, aerodynamic, **strategic** optimisation

TP video

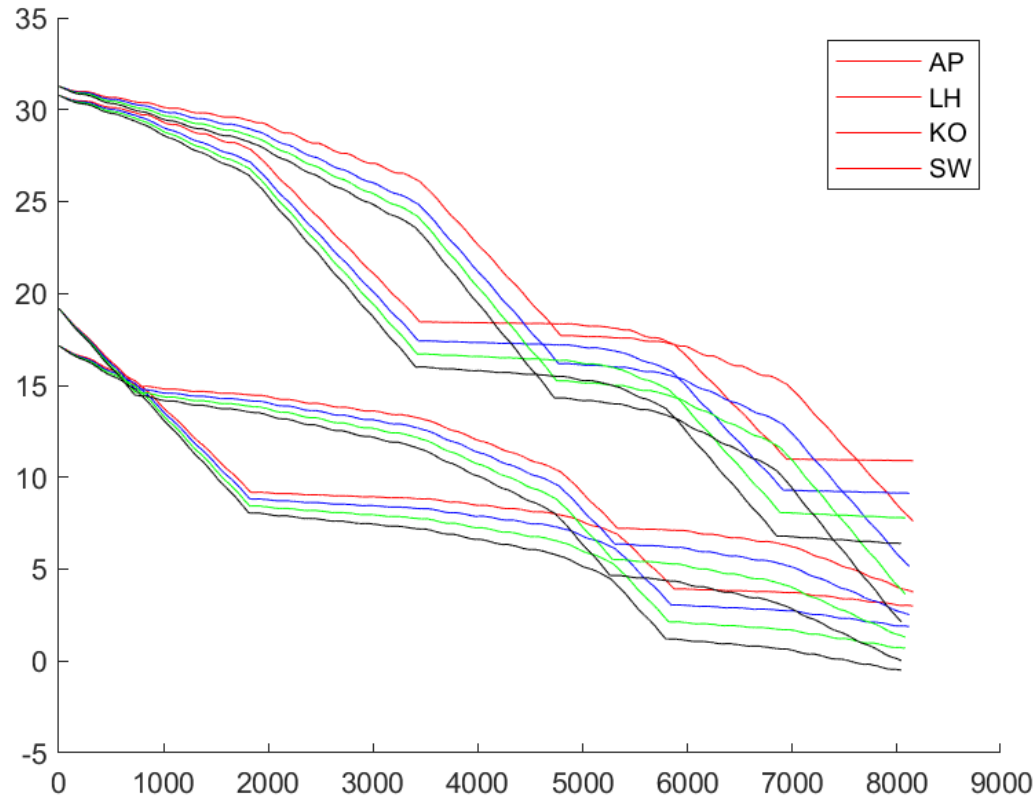
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Team pursuit model

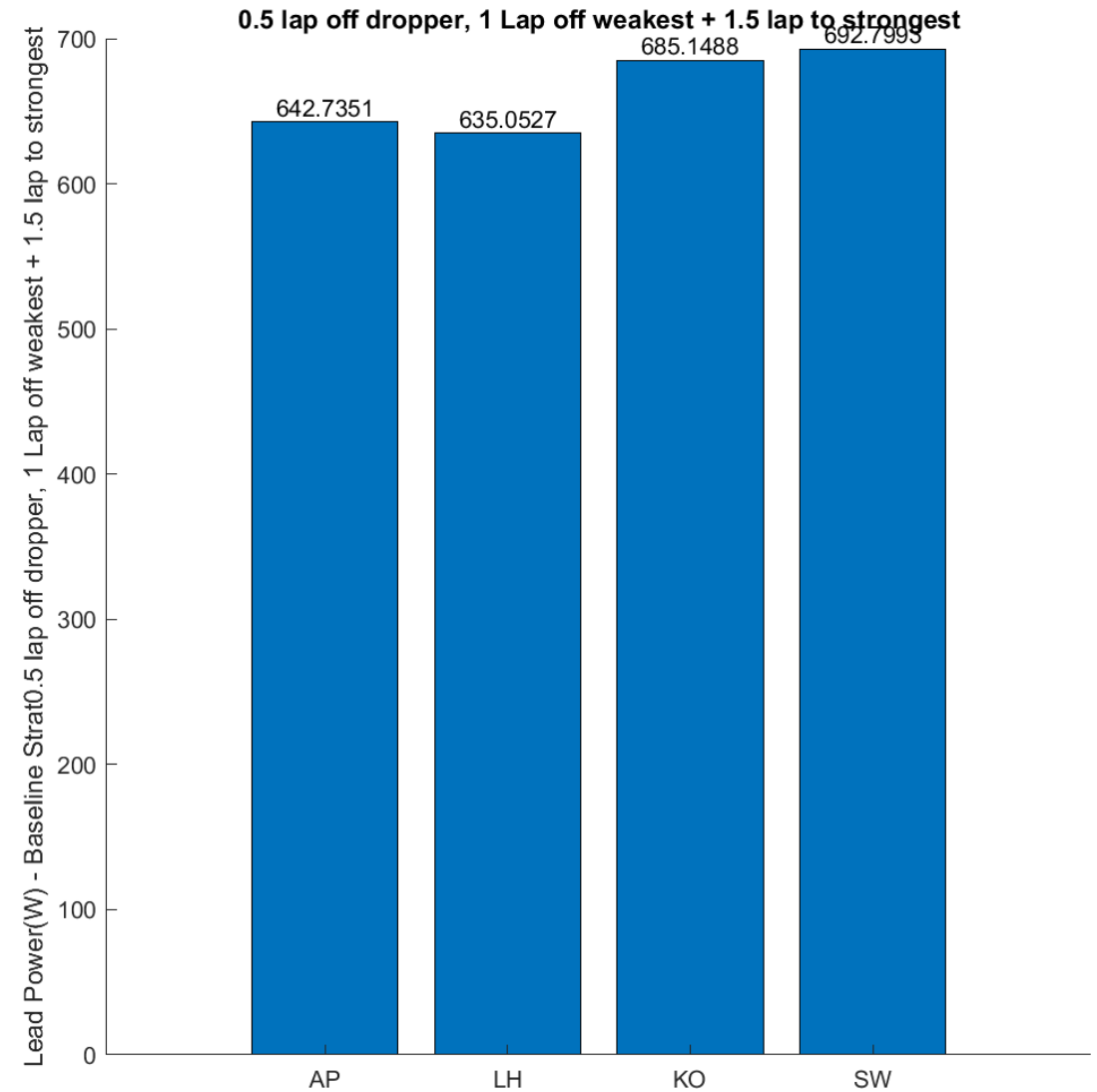


- Supply/demand model – proprietary track physics formulation
- Optimisation of the available ingredients
 - Start order
 - Number of turns
 - Turn duration
 - Who drops off?
- Approach
 - Starting assumptions.....?
 - Deterministic
 - Machine learning
- Customers / users
 - Sports scientists / perf. engineers
 - Coaches
- Format
 - Desktop executable

Current model

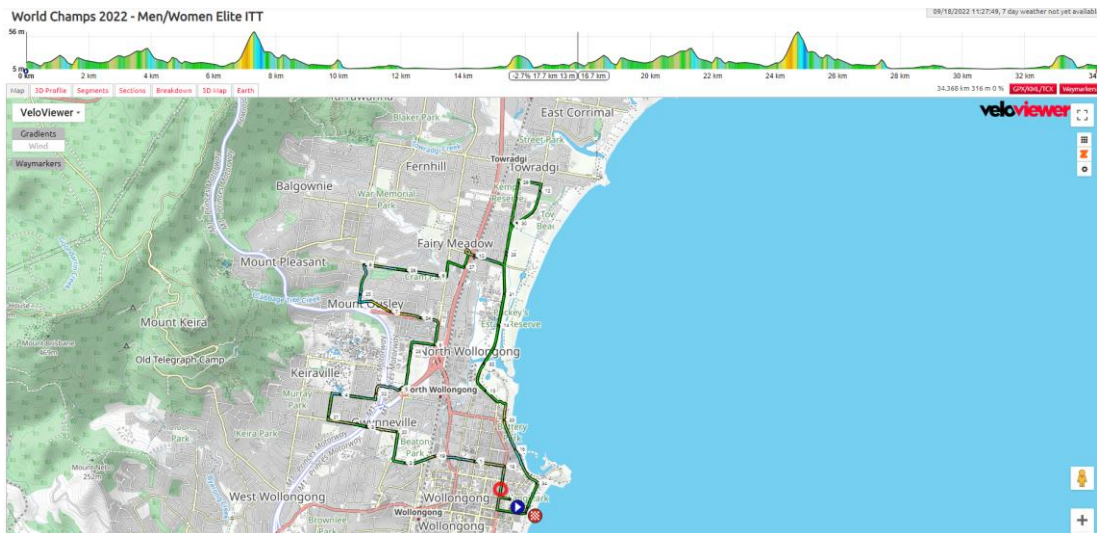


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Project #2: Outdoor road TT prediction tool

Outdoor Time Trial



- Supply / demand model
- Forward integrated in time
- Adjust variables
 - Weather (wind direction)
 - Power input profile
 - Weight
 - Aerodynamics
- See the outcome on total time
- Work out how to train / strategise to go fastest with a given athlete!
- Users: coaches, athletes, sports scientists
- Desktop executable / web based

Existing tools

Spreadsheet – in-house

- Can tune supply and demand model to keep up with latest proprietary research
- Better able to split the course into appropriate segments
- Spreadsheet – robustness / portability!
- Ability to easily add in a new course

Best Bike Split – web based

- Subscription
- Doesn't have ability to refine the physiology parameters for relevance to Elite athletes
- Black box
- Can easily change the course
- Intuitive adjustment of parameters
- User friendly