

A world map is shown in the background, divided into vertical bands of color: red/pink for North America, purple for Europe, cyan for Africa, blue for Asia, and dark blue for Australia. The map is overlaid with a grid of thin white lines.

IM²C 2017 Russia

School 179 team

<http://www.179.ru>

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Something new

- 1801 Richard Trevithick invented transport, based on steam power.
- 1830 in the United Kingdom started working first passengers` railway.
- 1840 speed of travel grew so high, that governments were forced to Introduce The time zones.



And more new

- 1900 Wright brothers' flying machine took off the earth.
- 1913 in the Russian Empire started first passengers' flights.
- Nowadays everyone can fly to every part of the world for a few hours.



New inventions – new problems

- Speed is high, but price is high too.
- Try to minimize this problem – try to seek optimal meeting place.





ALGORITHM AND BASE

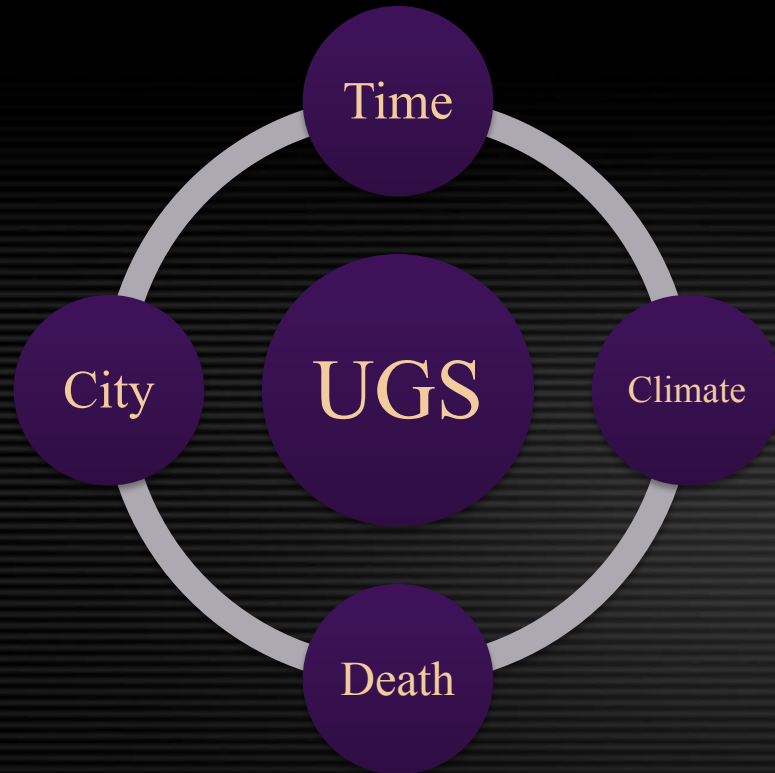


Geography

Earth is a multiplicity
of sectors.

Universal

Sector



Every UGS has
important parameters

Algorithm



Starting
UGSs



Analysis

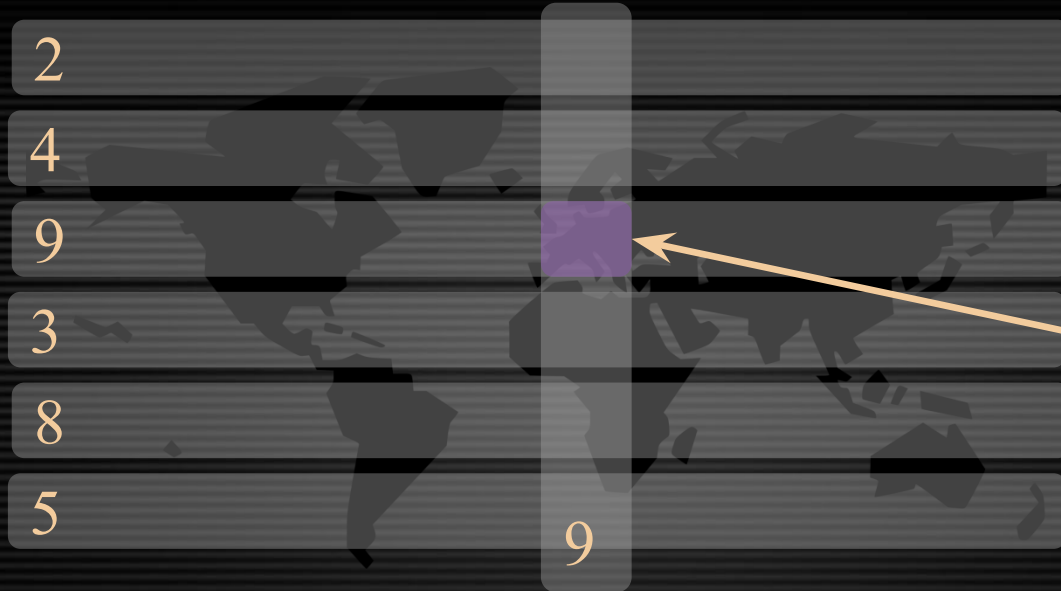


The best
UGS

Algorithm



Algorithm



The best place



JETLAG

Phenomenon itself



PARIS



LONDON



NEW YORK



SYDNEY

Jetlag is a process which starts after changing Time Zone.

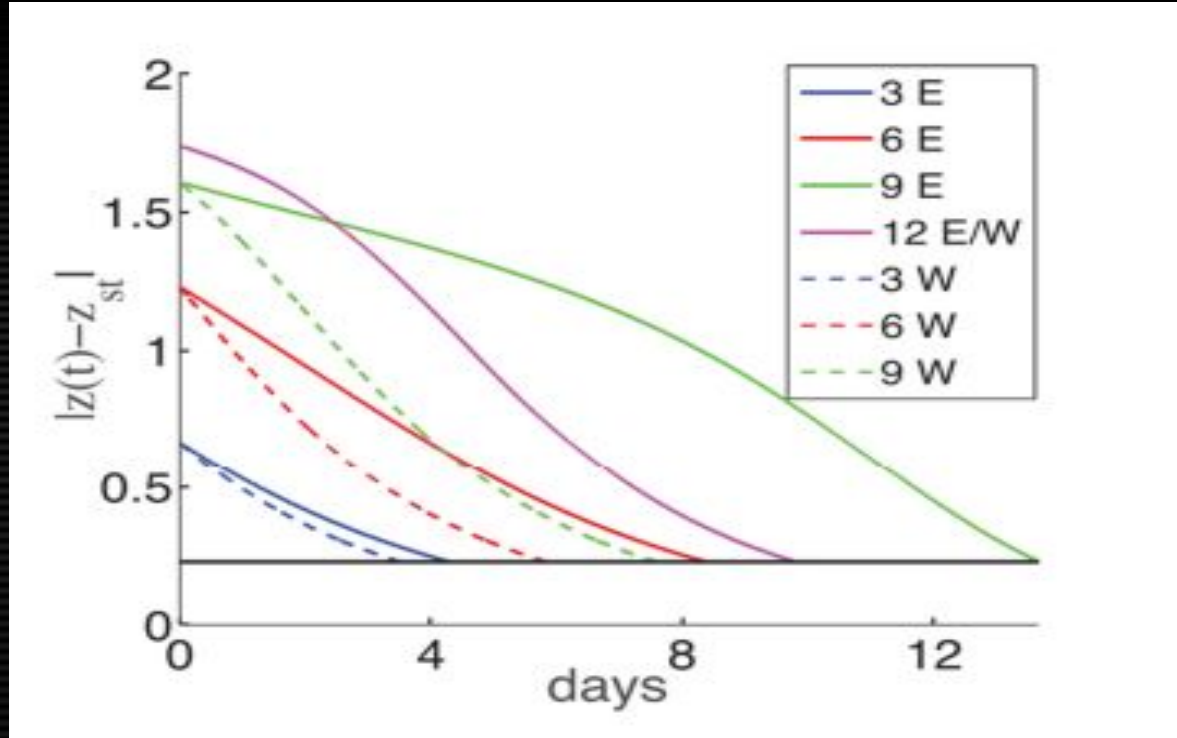


Calculating algorithm

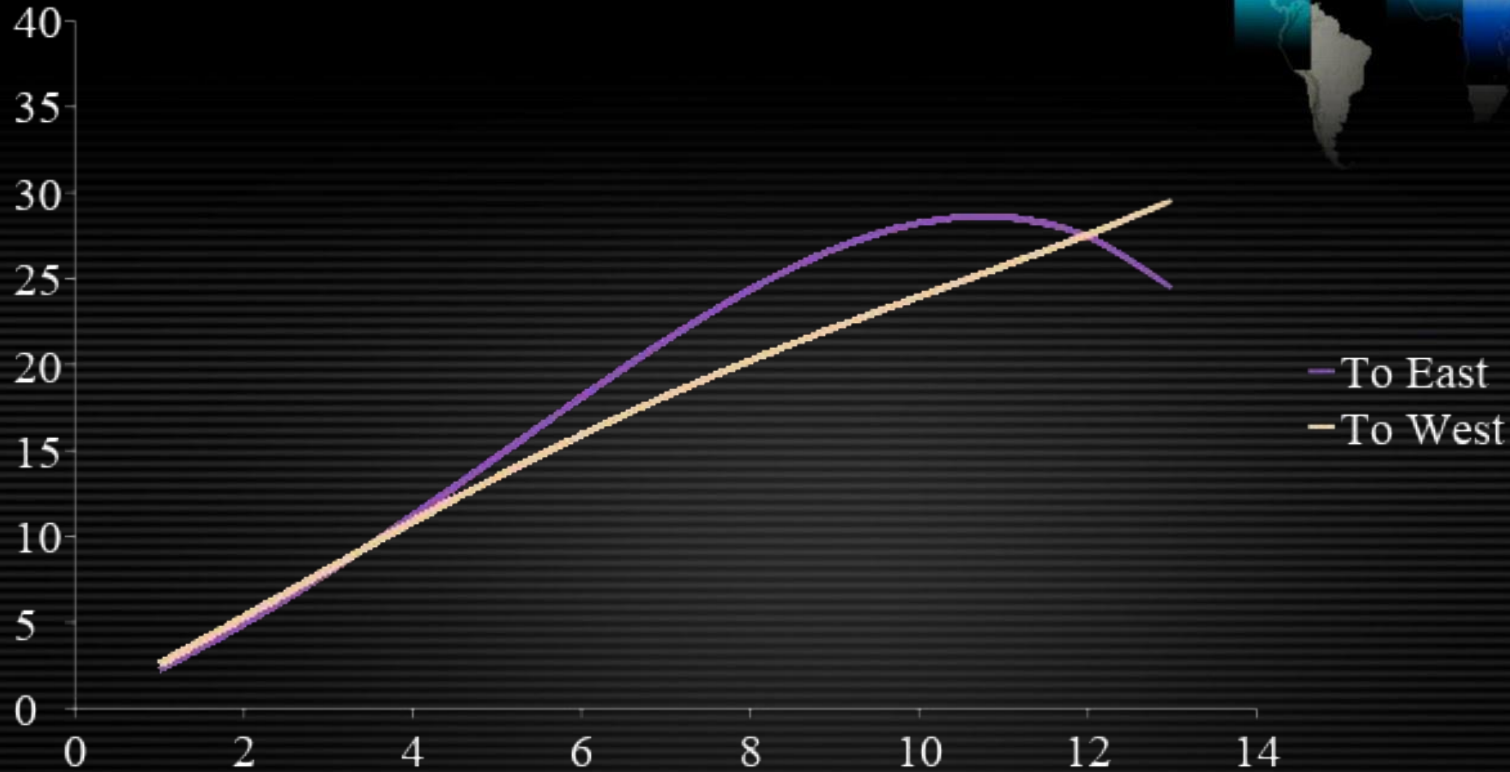


How to calculate

Base of extrapolating.



Calculating difference





ACCLIMATIZATION

Phenomenon itself

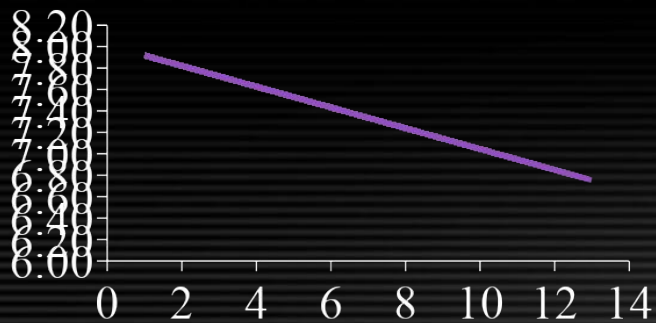


Acclimatization is a process which starts after changing climate conditions.

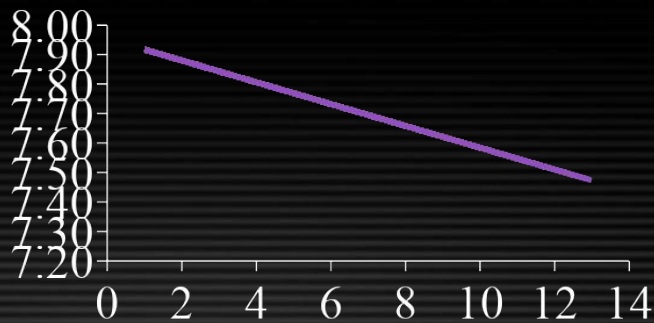
Research



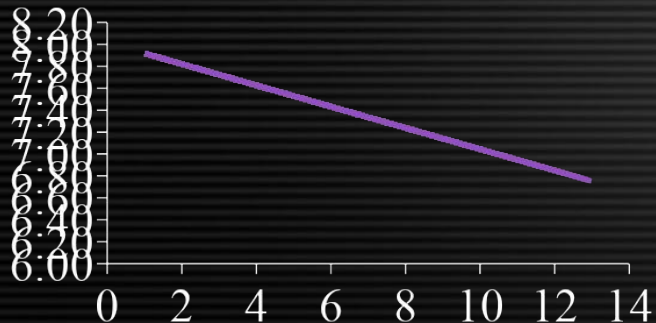
Pressure



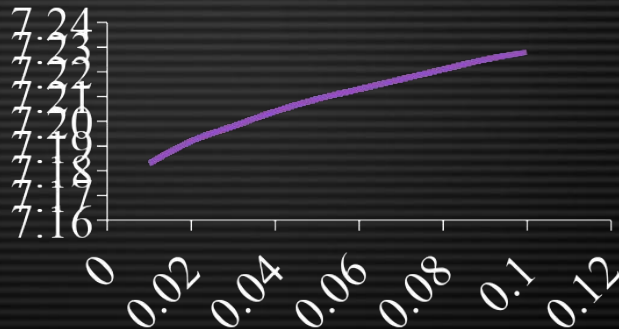
Air temperature



Inside temperature



Wind speed

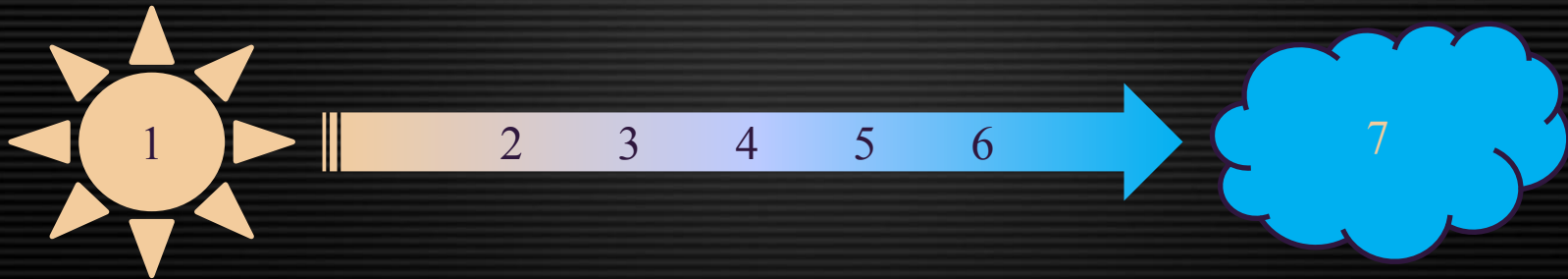


Van-Zeilen equation

To calculate comfort



$$K = 7,83 - 0,0968t_r - 0,0367P_a + 0,0367\sqrt{v(37,8 - t_a)}$$



Calculating algorithm



Comfort difference



- To the warm side ($Kr > 0$):

$$K_r = 0,1(t_{a2} - t_{a1}) + 0,00372 * (P_{a2} - P_{a1}) + \\ + 0,0367(\sqrt{v_1} (37,8 - t_{a1}) - \sqrt{v_2}(37,8 - t_{a2}))$$

- To the cold side ($Kr < 0$):

$$K_r = (0,1(t_{a2} - t_{a1}) + 0,00372 * (P_{a2} - P_{a1}) + \\ + 0,0367(\sqrt{v_1} (37,8 - t_{a1}) - \sqrt{v_2}(37,8 - t_{a2}))) / 2$$



COST

Money makes the world go round

Long way – big cost



The calculating formula



$$\left[\begin{array}{l} \left\{ \begin{array}{l} l < 1000 \\ s = (l * 9,08) + \left\lfloor \frac{l}{1000} \right\rfloor * 100 \end{array} \right. \\ \left\{ \begin{array}{l} 1000 < l < 3000 \\ s = (l * 9,08) * 0,9 + \left\lfloor \frac{l}{1000} \right\rfloor * 100 \end{array} \right. \\ \left\{ \begin{array}{l} 3000 < l \\ s = (l * 9,08) * 0,85 + \left\lfloor \frac{l}{1000} \right\rfloor * 100 \end{array} \right. \end{array} \right.$$



CONCLUSION

Model`s characteristics



- ✓ Avoid to compare power of different factors
- ✓ None uncountable parameters
- ✓ Possible to up accurate
- ✓ Final product
- Model neglects another factors.

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Thank you for attention

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