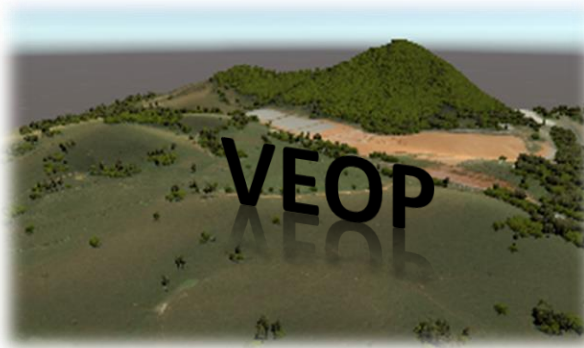


Situational Awareness Improvement: From Classroom to Field (digitally)

**Topological and tactical study modeling into a
virtual environment**





Purpose

- To know the concepts used on the Virtual Environment Observation Point (VEOP);

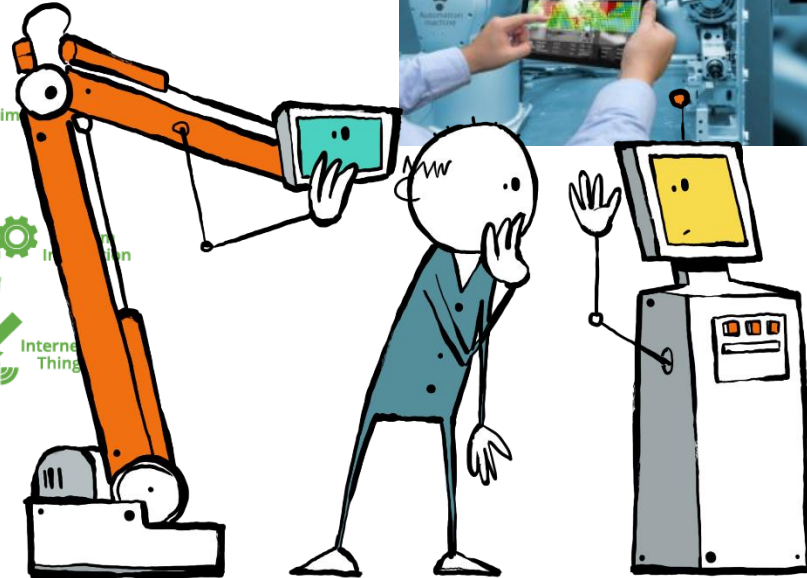
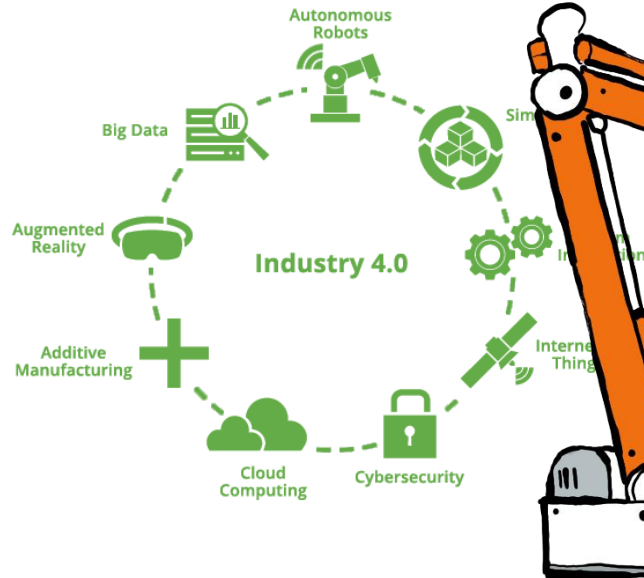


Topics

- Introduction;
- Military Doctrinal Motivations;
- Proposed Solution;
- Motion Sickness;
- Future projects;
- Conclusion.

Introduction

- Industry 4.0: possibilities;



Military Doctrinal Motivations

- Importance of the military aspects of the terrain;

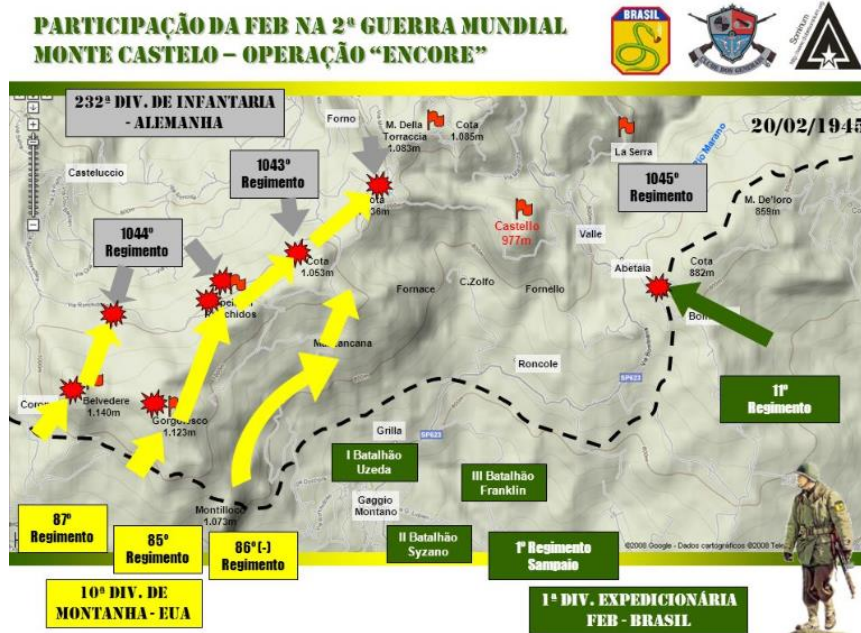
Good tactics can save even the worst strategy. Bad tactics will destroy even the best strategy.

— George S. Patton —



Military Doctrinal Motivations

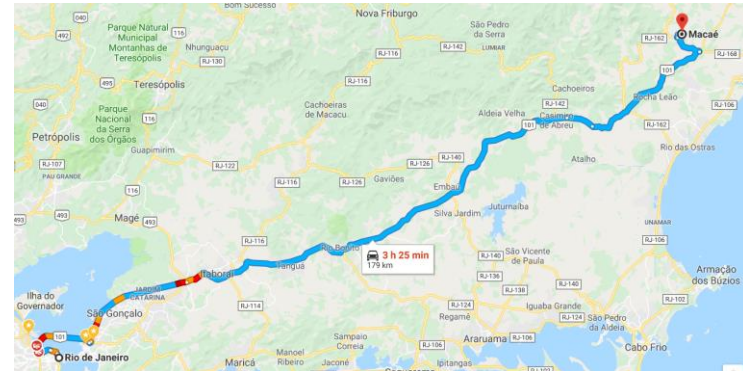
- Importance of the military aspects of the terrain;





Military Doctrinal Motivations

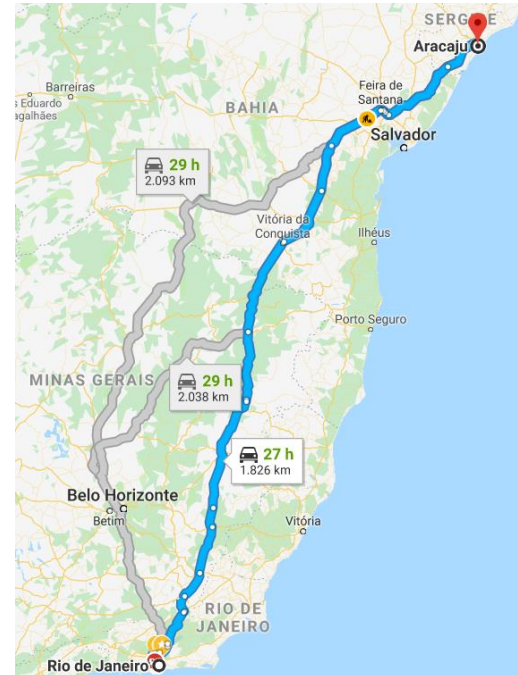
- Importance of the military aspects of the terrain;
- Military problem:
 - Availability;
 - Costs;
 - Personnel;
 - Preparation.





Military Doctrinal Motivations

- Importance of the military aspects of the terrain;
- Military problem:
 - Availability;
 - Costs;
 - Personnel;
 - Preparation.






Proposed Solution

- Mapping of the terrain Characteristics:
 - Obtaining the region (relief and images);

Real World Terrain Helper



Place selector

Show Open Street Map

ELEVATION

SRTM

Top-Left

Latitude: -22.30943
Longitude: -41.989750000000015

Bottom-Right

Latitude: -22.41103
Longitude: -41.8798800000000014

Area

Width: 11.30 km
Height: 11.30 km
Area: 127.64 km²

☐ Show grid
☐ Show best rect

Move selector

← → ↶ ↷

Copy this to Clipboard




Proposed Solution

- Mapping of the terrain Characteristics:
 - Obtaining the region (relief and images);
 - Roads;

Real World Terrain Helper

Mapa

Satélite



Place selector

Show Open Street Map

ELEVATION

SRTM

Top-Left

Latitude: -22.30943
Longitude: -41.989750000000015

Bottom-Right

Latitude: -22.41103
Longitude: -41.8798800000000014

Area

Width: 11.30 km
Height: 11.30 km
Area: 127.64 km²

☐ Show grid
☐ Show best rect

Move selector

←

→

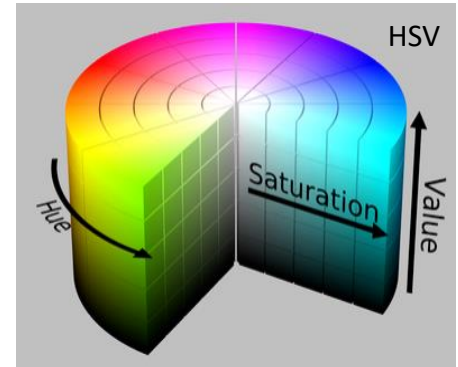
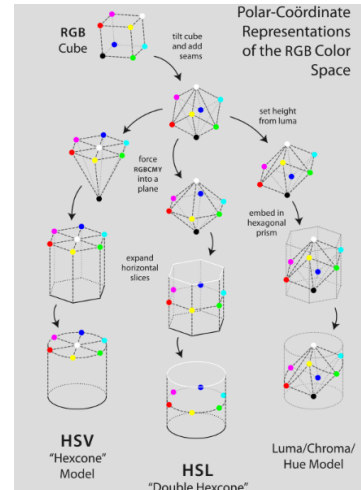
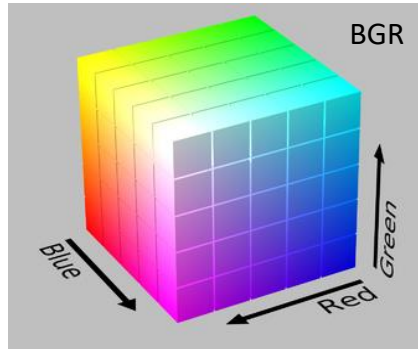
↑

↓

Copy this to Clipboard

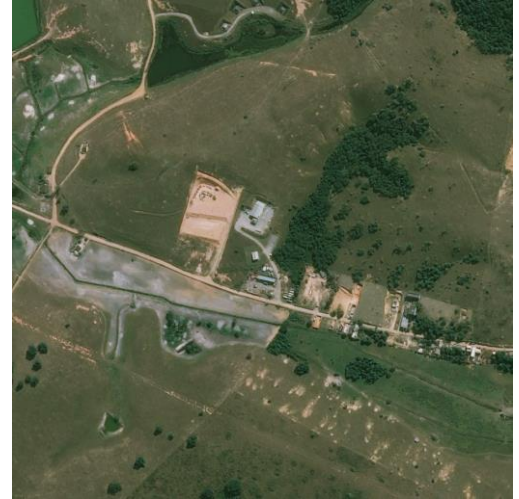
Proposed Solution

- Mapping of the terrain Characteristics:
 - Vegetation:
 - Conversion from BGR to HSV;



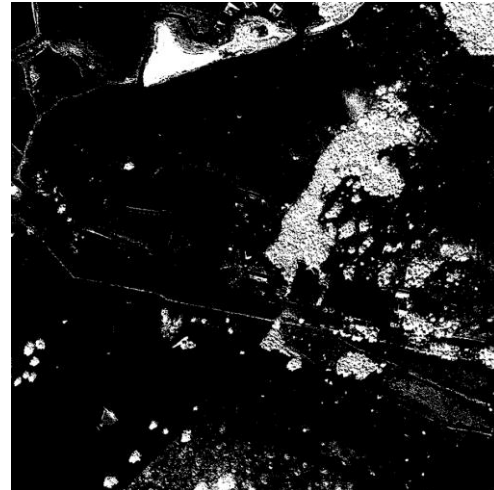
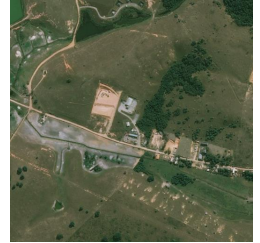
Proposed Solution

- Mapping of the terrain Characteristics:
 - Vegetation:
 1. Conversion from BGR to HSV;



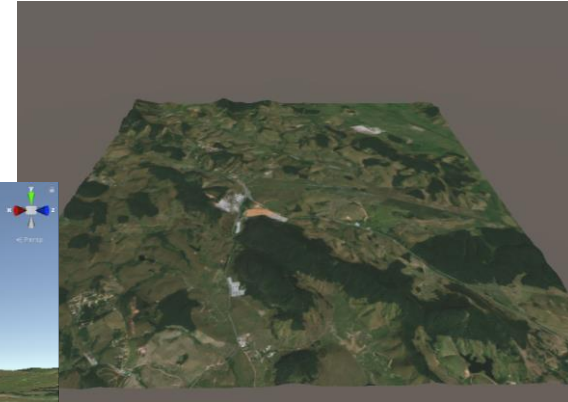
Proposed Solution

- Mapping of the terrain Characteristics:
 - Vegetation:
 1. Conversion from BGR to HSV;
 2. Threshold (black and white);



Proposed Solution

- Mapping of the terrain Characteristics:
 - Vegetation:
 1. Conversion from BGR to HSV;
 2. Threshold (black and white);





ITEC

14-16 May 2019

Stockholmsmässan, Sweden



 #ITEC2019

Proposed Solution





14-16 May 2019

Stockholmsmässan, Sweden



Proposed Solution





Proposed Solution

- Mapping of the Military aspects:
 - Station Point;
 - Northern General Direction;
 - Grids;
 - Relief, hydrography, planimetry;
 - Weather;
 - Animations;
 - Troops position;

Proposed Solution

- Interaction Instructor / Student:
 - Instruction place / equipment;
 - Instructor possibilities;



Proposed Solution

- Interaction Instructor / Student:
 - Instruction place / equipment;
 - Instructor possibilities;
 - Student possibilities.





ITEC

14-16 May 2019

Stockholmsmässan, Sweden



Instructor possibilities





ITEC

14-16 May 2019

Stockholmsmässan, Sweden



Instructor possibilities



Motion Sickness

- Dynamic Field Of View.





Future projects

- Augmented Reality;
- Integration with other systems;
- Adapt modules to gear(Rifle, helmet);
- Simulation Center (Holojam);



Conclusion

- Possibilities of the Solution proposed;
- Take the maximum of the military personnel;
- “We have to make them fail”;



Summary

- Introduction;
- Military Doctrinal Motivations;
- Proposed Solution;
- Motion Sickness;
- Future projects;
- Conclusion.



Raphael de Souza e Almeida

Brazilian Marine Corps / PUC-Rio MSc. student

Email: souzaoen@yahoo.com.br



ADSUMUS