TRUMP GAME – SATELLITES AND SENSORS: AN EDUCATIONAL RESOURCE FOR TEACHING GEOTECHNOLOGIES IN EARTH SCIENCES

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SUMMARY: The "Trump Game: Satellites and Sensors" is a free educational resource for higher and technical education in geotechnology, especially remote sensing applied to Geoscience. This material is available in English and Portuguese. The deck of cards brings together, in an organized and educational format, characteristics of the optical sensors on board of orbital satellites. For the first time we present the English-language version, developed to meet the international demand. We expect to promote the teaching resource as a showcase alternative for education. The card game is built on a broad survey on the basic characteristics of the most used sensors in optical remote sensing. The research was carried on with information from scientific articles, books and satellite image reseller websites. As a result, we present the teaching material (the deck), which is available for download and printing from the websites: http://trumpgamesatellitesandsensors.blogspot.com.br/ and http://trunfosatelitesesensores.blogspot.com.br/. The game comprises 70 sensors / satellites cards, with information from 70 different sensors used to acquire orbital images throughout the Earth. The twelve features included in each card are: 1) name of the satellite which the sensor belongs to; 2) satellites which carry the sensor (one or more, once some sensors are present in more than one satellite); 3) platform launch year; 4) platform altitude; 5) sensor's full name and acronym; 6) swath width (km); 7) number of spectral bands; 8) synthesis of the spectral range (nm); 9) spatial resolution (m) (GSD, Ground Sample Distance - at nadir); 10) radiometric resolution - quantization value related to the gray levels of the images produced by the sensor; 11) sensor's possible angles of view; 12) sensor's revisit frequency. Didactic practices using the "Trump Game" for remote sensing teaching should promote a comparison between the characteristics of different sensors, enabling the analysis and reflection on the potential of each sensor/satellite facing the environment diversity and different approaches undertaken when remote sensing in geosciences should be applied. So, three ways to play the card game are proposed: a) fast game; b) pre-established criteria, and; c) spontaneous challenge. The main difference between the three modes is the degree to which a teacher or a student can be problematizers, presenting different contexts of use of the sensors or basically comparing the "best" and "worst" features, in spite of always aiming a reflection about the intended application. This procedure defines the "quality" (or victory) of a sensor. In conclusion, it is emphasized that the game is based on competition: it provides an exercise, which, besides luck, requires from the students the best grasp of the capabilities, resolutions, advantages and disadvantages of each sensor. Insomuch, the game takes the students to manage their cards to face the proposed challenges. The knowledge construction process may help improving the student's capabilities.

KEYWORDS: EDUCATION, FREE EDUCATIONAL MATERIAL, REMOTE SENSING