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# Potential paths and historical road network between Italy and Egypt: from predictive to postdictive approach



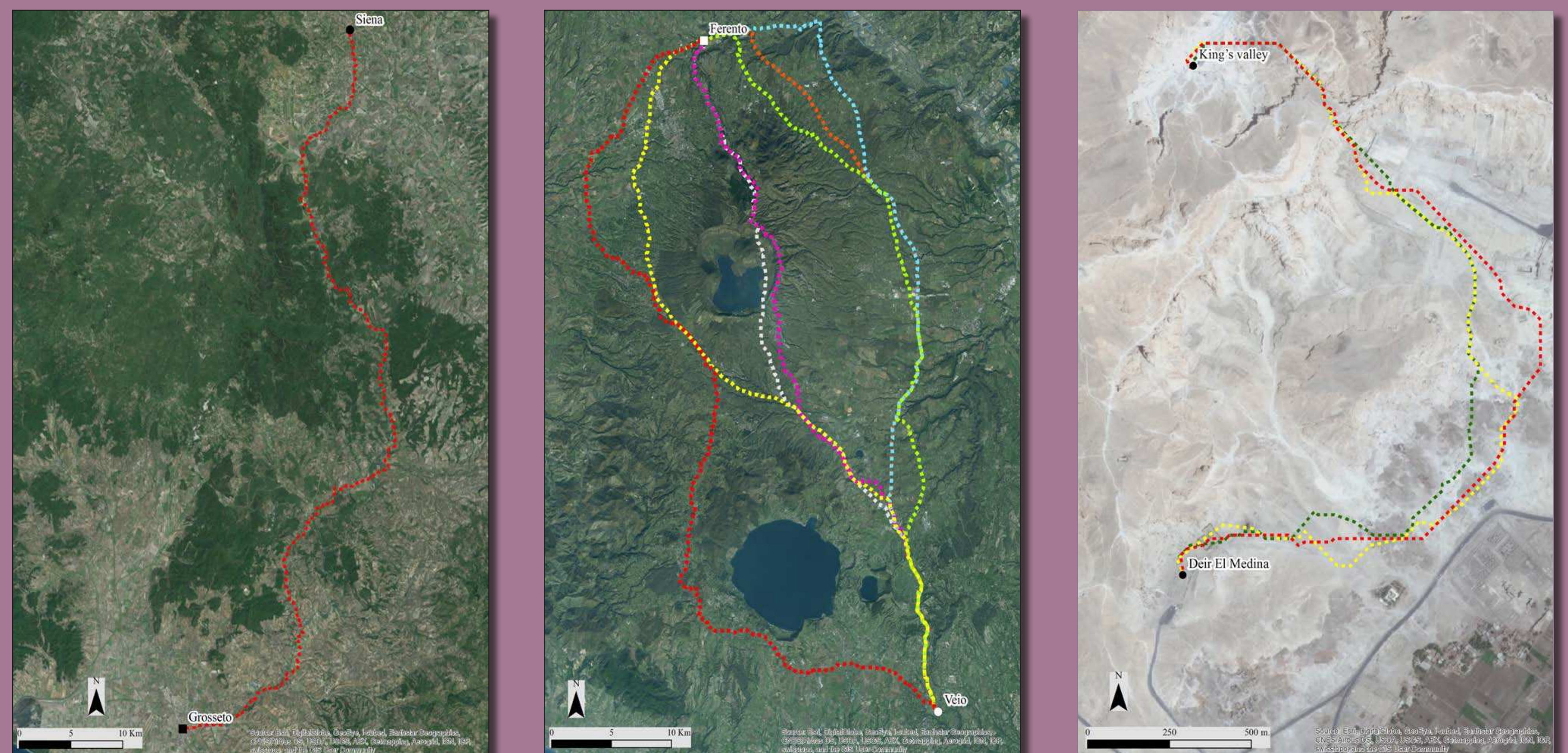
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In this poster we wish to present the preliminary result of a three case of study focused each one on the predictive and postdictive approach to historical routes. We developed and tested the procedure in three different geographical areas: southern Tuscany, northern Lazio and the king's valley in Egypt. Our work consists of three main steps. The first one is predictive. We evaluated the movement in a given context and period. In this phase we produced several potential paths between two known settlements, by changing the weight of the environmental and cultural factors. In the second step we verified the forecast directly on the field. The fieldwork is a crucial step to get the necessary information to establish the reliability of the simulations processed. The last step is postdictive. We change the question and we ask why they used exactly those paths. In these case studies we integrated all the available data, including those obtained during the survey. We modelled several cumulative cost surfaces to produce a simulation that overlaps as much as possible the historical paths.



In these images we show the location and the extension of all the sample areas chosen in this research: on the left the south Tuscany, in the middle the northern Lazio and on the right the King's valley in Egypt (near to Luxor).

All the chosen parameters are based on the concept of attractor, repellers, facilitators and obstacles. The first two act at a distance, while the others directly on the ground. Through the cost surfaces created with this characteristics we evaluated a several potential paths, by changing each time the weight factors inside the formula. In this phase we weighed the slope as environmental factor and as parameter driven by human choice. For example: obviously a gentle slope favor the traveler more than a steep slope, but sometime the natural choice can be overwhelmed by a cultural consideration such as the need to have shorter route. Everything was related to the needs of travelers. A pilgrim, a merchant, or an army had a different way to moving and also a different destination.

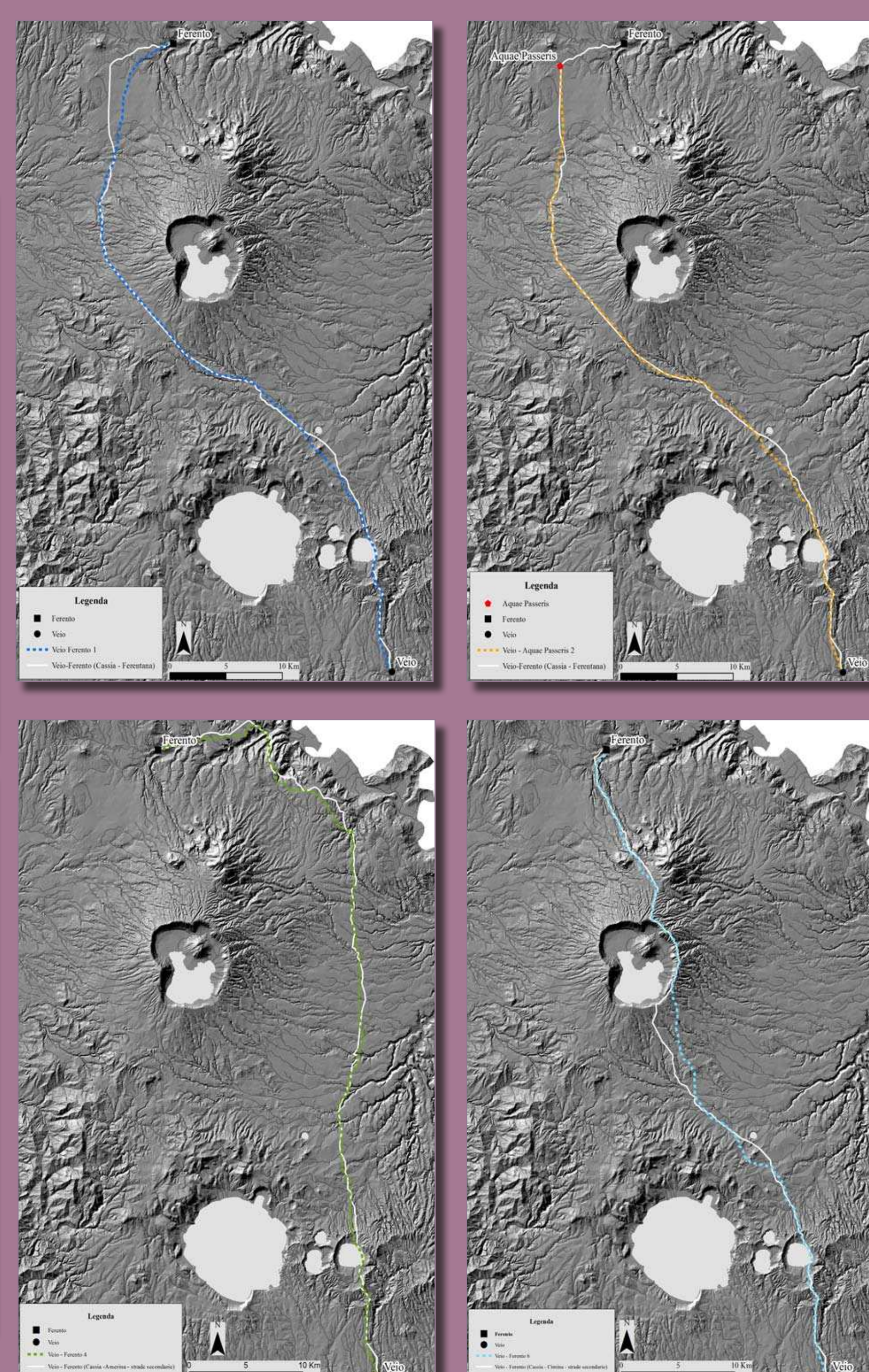


The images above show some predictive paths evaluated between Siena-Grosseto (on the right), Veio-Ferento (in the middle) and form Deir El Medina to King's valley (on the left). In the three cases displayed, the potential paths consider a slope among 0 and 5% like an attractor.

During the field survey we checked, first, the landscape morphology in relation to the historical paths direction. In this way we had a chance to verify the real environmental characteristics (slope, hydrography, soil's drain, etc.) used in the data elaboration process. After we controlled all critical parameters (for example: in the northern Lazio the chance to cross some ravines) evaluated in the cost surfaces.



Some pictures taken during the field survey. In upper left the via Cassia close Risieri, in the upper and bottom right a stretch of the historical path between Deir El Medina and King's valley. In the two images we can observe the many slope changes along the way. In the bottom left we offer an example of a ravine crossing along the Amerina path. As we can see in the photo, the modern road still pass in this point.



In the four images above, the simulations between Veio and Ferento are overlapped to the historical paths (the white lines). In a 100 m. buffer from the latter, the potential paths reach the threshold of 50%, but in 150 buffer they overstep also the 60%.

In the last one step, the postdictive, we modelled the cost surface until when the computer does not produce a potential path that has a match equal to 50% with the historical route, within a 100 and 150 m buffer centred on the latter.



In Egypt we managed to elaborate a potential path that overlaps a 100% with the historical route used by the egyptians craftsman (see above). To produce this outcome we worked with the slope values, assigning a lesser weight to all the steepest slope.