

Engraved footprints from the past. Retrieving cartographic geohistorical data from the Cassini *Carte de France*, 1750 - 1789

Bertrand Duménieu^{a*}, Julien Chadeyron^b, Pascal Cristofoli^a, Julien Perret^{a,c}, Laurence Jolivet^c, Stéphane Baciocchi^a

^a EHESS, CRH, bertrand.dumenieu@ehess.fr, stephane.baciocchi@ehess.fr, pascal.cristofoli@ehess.fr

^b University of Clermont-Ferrand (UCA), julien.chadeyron@uca.fr

^c Univ. Paris-Est, LASTIG STRUDEL, IGN, ENSG, julien.perret@ign.fr, laurence.jolivet@ign.fr

* Corresponding author

Keywords: Cartographic Heritage into the Digital, History of Cartography, Map Design, Open Source Geospatial Technologies, Digital Humanities and GIS, Transition to Modern and Contemporary Mappings

Abstract: Antique maps are full of engraved geohistorical features. They provide representations of past states of the geographical space and are favored by historians and social scientists for their uniqueness and coherence. Working on a GIS dedicated to the history of the French territory, we extracted spatial information from the Cassini *Carte de France* (full name *Carte Générale & Particulière de la France*) as vector data. Based on the first geodetic survey of France [1, 4], this well-known and monumental map has been drawn on 182 paper sheets of size 610 x 955 mm at the scale of 1:86,400 or 1 line for 100~toises (1 inch to 1.36 miles). It depicts the French territory with fine-grained information about populated and named places, settlements, landscape features, hydrographic, ecclesiastical and road networks [3, 5, 6, 7]. As a case study, the sheet numbered 52 provided more than 6 800 spatial footprints that we have stored as a geographic database. Following the distinction made by Cassini himself between “geometric” and “topographic” entities, our geographical database is composed of two families of data, namely *Triangulated Geographical Entities* (“geometric” entities in Cassini’s own terms) whose geodetic properties are partly documented and *Relative Geographical Entities* (“topographic” in Cassini’s terms) which are dependent on and located relative to the former (Fig. 1). Those entities are analytically distinct but come together from a single artifact: the primary source they are engraved in during the mapmaking process. Because this process of embeddedness is not fully documented, retrieving both classes of entities called for a cautious cartographic visualisation with similar semiological rules and aesthetics as the original historical map (Fig. 2). This “Cassini map style” preserves the cartographic properties of the geohistorical data extracted from this primary source: generalisation, scale, spatial granularity and the overall intentions of the mapmakers [2]. Often neglected, such properties are constitutive components and dimensions of the mapping style which forms the context and gives crucial information on the accuracy and the relationships between geo-historical data enclosed in. Our poster provides a renewed cartographic visualisation of the sheet 52nd sheet of the *Carte de France*, centred on the french cities of Clermont, Riom and Thiers. It reveals unnoticed cartographic entities that were hardly legible in the original map. The historiography of cartography has been largely, and for a long time, based on critical edition of old maps published as non-georeferenced *facsimile*. We propose to renew this approach by producing digital maps from vector geographic databases that combine the aesthetics and semiology of old map styles with the modelling capabilities of modern GIS.

References:

- [1] C.-F. Cassini. *Description géométrique de la France*. Imprimerie Desaint. Google-Books-ID : RDRéAAAACAAJ.
- [2] S. Christophe, B. Duménieu, A. Masse, C. Hoarau, J. Ory, M. Brédif, F. Lecordix, N. Mellado, J. Turbet, H. Loi, T. Hurtut, D. Vanderhaeghe, R. Vergne, and J. Thollot. Expressive map design: Ogc sld/se++ extension for expressive map styles. *Proceedings of the ICA*, 1:21, 2018.
- [3] F. de Dainville (1955). La carte de Cassini et son intérêt géographique. *Bulletin de l'Association de géographes français*, 32(251), 138-147. URL <https://doi.org/10.3406/bagf.1955.8014>.
- [4] J. V. Konvitz. Redating and rethinking the cassini geodetic surveys of france, 1730–750. *Cartographica : The International Journal for Geographic Information and Geovisualization*, 19(1) :1–15, 1982. URL <https://doi.org/10.3138/W62K-3152-7062-5267>.
- [5] C. Motte and M-C. Vouloir. Le site Cassini.ehess.fr : un instrument d’observation pour une analyse du peuplement. *Revue du Comité Français de Cartographie*, 191, 68–84, 2007.
- [6] J. Perret, M. Gribaudi, M. Barthelemy, N. Abadie, S. Baciocchi, C. Bertelli, O. Bonin, P. Bordin, B. Costes, P. Cristofoli, B. Dumenieu, J. Gravier, J.-P. Hubert, P.-A. Le Ny, E. Mermet, C. Motte, M. Pardoën, A.-M. Raimond, S.

Robert, and M.-C. Vouloir. The 18th century cassini roads and cities dataset, *Harvard Dataverse*, 2015. URL <https://doi.org/10.7910/DVN/28674>.

[7] J. Perret, M. Gribaudi, and M. Barthelemy. Roads and cities of 18th century france. *Scientific data*, 2 :150048, 2015. URL <https://doi.org/10.1038/sdata.2015.48>.

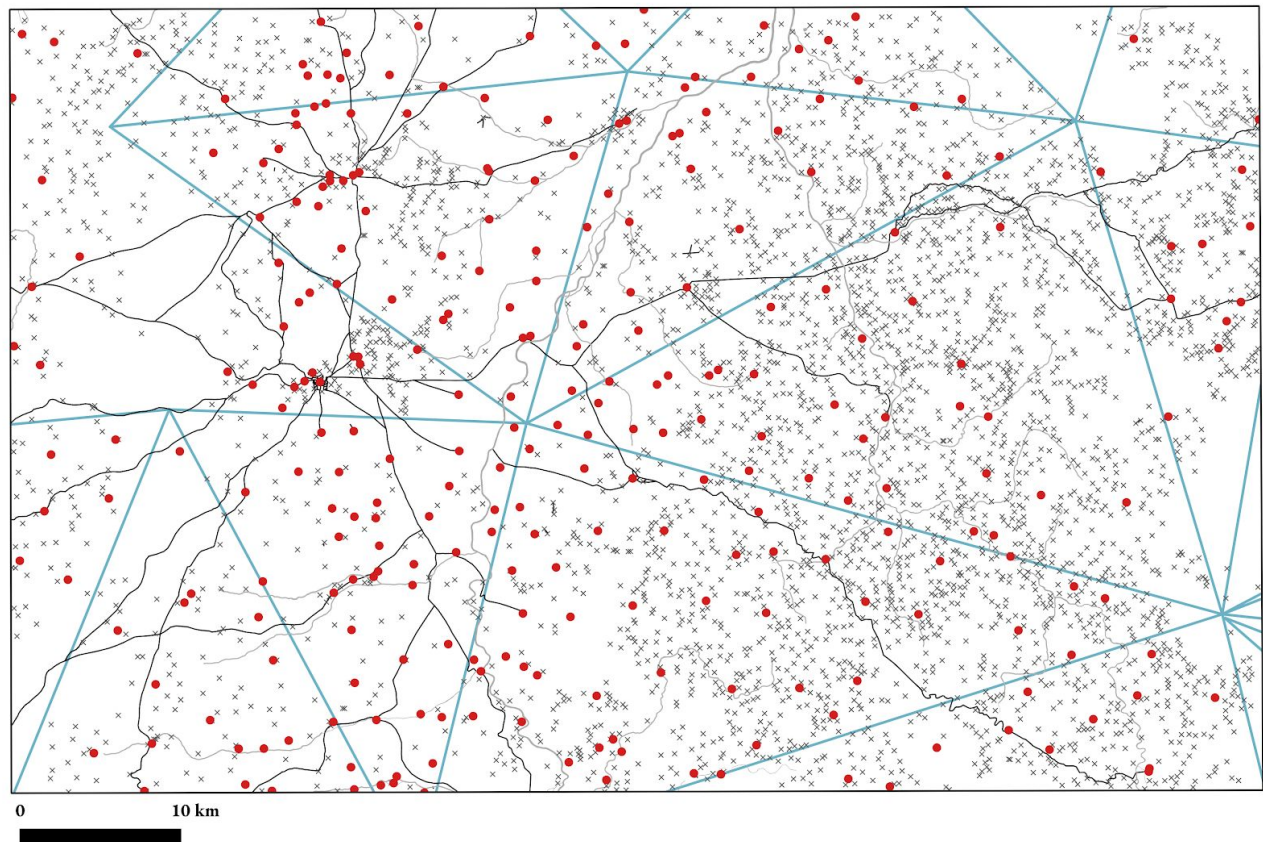


Fig. 1. Triangulated (316 red dots) and Relative Geographical Entities (6 565 grey crosses) in the 52nd sheet of the Cassini map (1759-1777). The first-level triangulation used by surveyors is figured in blue.



Fig. 2 (a) a view on the original Cassini map of France (sheet 52, 1759-1777) and (b) the extracted vector data mapped with the "Cassini" map style (2019).