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The Tree of Philosophers: design and implementation of a digital resource for the history of academic philosophy

Guido Bonino¹, Nicola Ruschena²

¹ University of Turin, Italy – guido.bonino@unito.it

² FINO Consortium, Italy – nicola.ruschena@unito.it

ABSTRACT

Our contribution is a presentation of the Tree of Philosophers (ToP), a digital resource for the reconstruction of academic family trees in the history of philosophy, resulting from an on-going collaborative effort of historians of philosophy. ToP's trees represent specific socio-institutional networks of knowledge transmission, as they are made of lines of academic descent that connect philosophers on the basis of institutionalized master-pupil relations. Descent relations are labelled according to specific models varying with historical and institutional contexts, developed in close collaboration with experts in different historical domains. ToP relies on a simple infrastructure whose core is ToP's relational database, which stores philosophers, relations and labels. ToP data have been retrieved from a variety of institutional and administrative sources, integrated by the examination of professional and biographical sources and by selected parts of available genealogical reconstructions. ToP's sources and criteria for data collection allow the resource to include large amounts of philosophers regardless of their notability, thus providing access to a massive extra-canonical collection of non-famous authors. Dealing with 15000 philosophers (mostly unknown) in the first release of ToP presented many challenges concerning FAIRification issues. Such issues have been managed by mapping ToP philosophers on external repositories of virtual identifiers for authority data, integrating them in ToP's database.

KEYWORDS

Linked Open Data; Research infrastructure; Academic descent; Social history of philosophy; Digital resources.

1. INTRODUCTION

The Tree of Philosophers (ToP) is a digital resource for the reconstruction and representation of academic family trees in the field of philosophy. ToP is an ongoing collaborative project, whose network is growing after the first release of the resource at the end of 2023¹. The use of the term “tree” may involve some suggestions that are not, rigorously speaking, correct. In fact, it may happen that a philosopher has more than one “parent” (multiple supervisors, compresence of different kinds of master-pupil relationships, etc.), so that what one gets is not a simple tree, but a more complex graph, branching in both directions. Furthermore, the data collected do not give rise to a single connected graph, but rather to a number of unconnected ones.

Keeping track of academic kinship and descent has been popular practice in fields like physics and mathematics: master-pupil relationships, often based on the *Doktorvater* role, have been recorded in many universities starting from the 16th century, thus providing records that are now converging in online repositories such as Wikidata² and in domain-specific resources such as the Mathematics Genealogy Project³. More recently, academic family trees appeared for other disciplines: Neurotree⁴ reconstructs the academic genealogy of neuroscientists, and it soon overlapped with the development of a multidisciplinary academic tree by Princeton researchers⁵. Family trees have been provided for philosophy as well (although with little coverage from both a historical and geographical point of view): Princeton's academic tree has a section devoted to (a part of) US-related philosophy, while famous Australian philosopher David Chalmers hosts the Australasian Philosophy Family Tree⁶ on his personal website.

In this landscape, the aim of ToP is to provide an infrastructure available for both public consultation and support to historical research that is focused exclusively on institutional relations, while allowing for comparison among differently characterized contexts.

¹ “Tree of Philosophers”. <https://treeofphilosophers.it/>

² “Wikidata”. https://www.wikidata.org/wiki/Wikidata:Main_Page

³ “The Mathematics Genealogy Project”. <https://www.genealogy.math.ndsu.nodak.edu/index.php>

⁴ “Neurotree”. <https://neurotree.org/neurotree/>

⁵ “The Academic Family Tree”. <https://academicfamilytree.org/>

⁶ “Tree – David Chalmers”. <https://consc.net/tree/>

Data provided by ToP are expected to support historical research especially in its sociological aspects. Indeed, ToP's graphs represent a specific kind of socio-institutional networks in the transmission of academic knowledge, built by connecting philosophers (nodes) by a finite set of types of descent relation (arcs). The use of historical network analysis can be of great use in the reconstruction of phenomena affecting different fields or connecting separate traditions [3], [4]. Moreover, the analysis of academic careers [1] and institutional dynamics of power [2] can provide valuable insights for the reconstruction of the interplay between philosophical traditions.

2. DATABASE STRUCTURE

The core of ToP is a relational database consisting of three tables: the Philosophers table, the Edges table and the Labels table. The schema is shown in Figure 1.

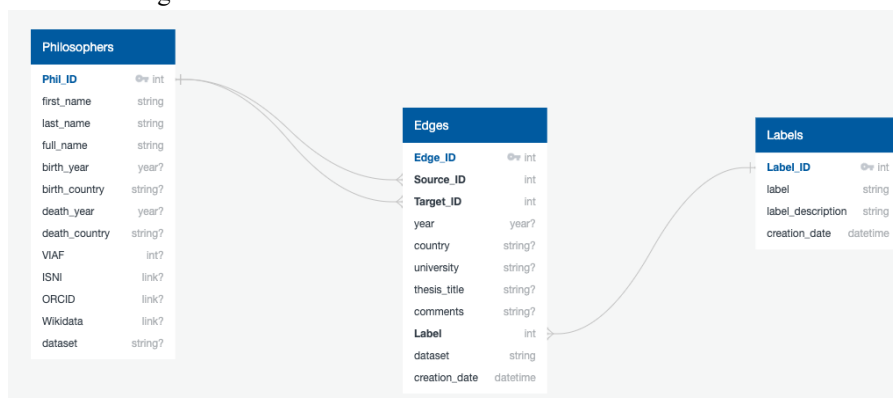


Figure 1

In the Philosophers table, rows are indexed by unique numerical identifiers that are internal to ToP's database, which are the primary keys for accessing philosophers' metadata. Each row stores data about one philosopher: name, places and dates of birth and death. As it will be discussed further, external personal identifiers are recorded whenever possible.

The Edges table stores data concerning the descent relations between philosophers. Since ToP is conceived as an incremental project, the design has been oriented towards simplicity and extensibility: the relation table stores ordered pairs of genealogical "masters" and "pupils" (with foreign keys redirecting to the philosophers' IDs). Noticeably, genealogic lines of descent are unpacked in relations linking two people, a "source" (parent) and a "target" (offspring) of the relation of descent. Each asymmetric relation is indexed by a unique internal identifier and features a year, a country and an academic institution that characterise the specific relation. In those cases in which the relation is connected to the production of a text (e.g. PhD theses for relations of PhD supervision), the title of the text is stored in a specific field, while an additional field is provided to store comments. Comments also store bibliographic references that may be useful to corroborate the descent link, such as snippets of online curricula stating the name of PhD supervisors or archival references. The label assigned to each relation is a foreign key referencing a specific relation type stored in the Labels table.

Labels table distinguishes among various types of genealogical relationships, such as PhD supervision, graduation thesis supervision, direct tutoring, etc. Each label is assigned a description, which is a textual dossier providing contextual information regarding the historical relation captured by the label and its context of application, provided by the domain experts who identified the specific type of genealogical relationship.

The storage of biographic metadata provides a simple yet effective geographical and chronological individuation of philosophers, while metadata characterizing relations allow researchers to filter their queries by years, countries and academic institutions

These structures allow for the formalization of different historical relations of academic descent, provided that they can be located geographically, chronologically and institutionally. This enables ToP to sustain the addition of a variety of socio-institutional devices of academic filiation characterizing different historical settings⁷.

3. INSTITUTIONAL RELATIONS OF DESCENT

ToP focuses on institutional relations, that is to say, on relations that are institutionally recognized, and that can – at least in principle – be documented as such. This means that generic relations of influence, however certain and significant, are not accounted for. The focus is deliberate: ToP is intended as a resource concerning the institutional (which usually means academic) transmission of philosophy. Keeping this kind of transmission distinct from other, more informal, channels

⁷ "ToP Labels". <https://treeofphilosophers.it/labels>

allows for possible comparisons, which would be made impossible by mixing things up. It is probably interesting, for instance, to be able to observe whether the institutional genealogy of philosophy, in specific spatial-temporal circumstances, does or does not approximate the usual historiographic picture of that philosophical context. Moreover, taking generic relations of influence into account would require an appreciable amount of arbitrary decisions for each case. All that would make the Tree of Philosophers the final result of a complex historiographic work, in which the judgments of the editors would play a crucial role. By contrast, we conceive of the tree not as a final result, but as the possible starting point for other researchers; in consideration of both this aim and the collaborative nature of ToP, it is certainly better to keep the role of personal judgments, though well meditated, to a minimum.

ToP started out by considering the most commonly acknowledged historical relation of academic descent, that is the relation between PhD candidate and supervisor⁸. Although this kind of relation is common in contemporary academia, many academical environments have been characterized by different institutional relations.

The first part of the project has been devoted to the reconstruction of significant samples from different historical academic contexts characterized by the availability of this kind of relation: 19th- and 20th-century Germany, the United States, Austria, 20th-century Canada, Australia, New Zealand. The voluntary collaboration of a number of historians and PhD candidates in history of philosophy at the university of Turin allowed ToP's scope to grow, encompassing 19th-century French academic training, mid 20th-century Oxford university, 20th-century Italian universities⁹. By relying on specific knowledge of the historical configurations of academic institutions in diverse contexts, collaborators defined historically sound and thoroughly described relations of academic descent, that are used in labelling descent relations in ToP database.

4. PERSONAL IDENTIFIERS

The core data regarding people and relations recorded in ToP are retrieved, whenever possible, from institutional repositories. Such data are integrated with the results of further archival work by ToP researchers browsing archives, on-line repositories and domain-specific literature (with an obvious focus on biographical works).

ToP's criteria for the inclusion of people in the Tree of Philosophers are quite broad: anyone who ever granted or received a high-level academic degree *to* or *from* someone who either granted or received a high-level academic degree in philosophy is, in principle, a proper addition to the tree.

People (philosophers) are thus included in the tree regardless of their notability, their career paths, their productivity in the intellectual domain or the reception of their works.

Moreover, a significant part of the tree's domain is populated by what we can naïvely call non-famous philosophers. We cannot provide an esteemed ratio yet (yet!), but common sense is sufficient to assume that in most historical contexts in which academic philosophical training exists, people graduating in philosophy usually outnumber people becoming notable because of their philosophical work (regardless of training and background).

In some cases, non-famous people have left fewer traces (e.g. because they did not publish philosophical works, having pursued different careers), but what is noticeable in most cases is that those traces that have been left by non-famous people are harder to find and to put together. By relying on resources such as Proquest¹⁰, for example, we can find names of philosophers graduated in the USA in the second half of the 20th century along with the titles of their theses. Nonetheless, such names and titles are seldom sufficient for the attribution of descent relations: apart from cases concerning well-known philosophers, it is very difficult to assess if different pieces of information linked to a name do refer to the same person.

Providing a couple of examples, we retrieved the identities of seven different philosophers whose last names are "Davidson", all of them being trained in the US and active in the 20th century; considering the forty philosophers whose last name is "Johnson", we have been able to distinguish four different "David Johnson" with different and sometimes punctuated middle names, all trained in the US between 1949 and 1978. The attribution to the same people of data retrieved

⁸ Indeed, this relation is usually the only institutional link that is used by other academic trees. See "Neurotree". <https://neurotree.org/neurotree/>; "The Academic Family Tree". <https://academicfamilytree.org/>; "The Mathematics Genealogy Project". <https://www.genealogy.math.ndsu.nodak.edu/index.php>; "Tree – David Chalmers". <https://consc.net/tree/>

⁹ The PhD system did not exist in the Italian academic framework before 1983, while formal supervision for French PhDs was only introduced in 1969. In the Italian context, the supervision of graduation theses closely aligns with the PhD model, requiring only minor adjustments, such as the addition of a label to differentiate between PhD supervision and graduation supervision. In contrast, the French system did not include direct, one-to-one supervision until more recently, necessitating the consideration of entirely different forms of academic relationships. For the 19th century, for example, a useful approach is to examine the relationship between the lecturer at the École Normale Supérieure in a given year and the students attending their lectures during that same period. For 20th-century Oxford University (at least up to the 1950s), the most pertinent institutional relationship is likely the tutorial system in philosophy. Further details can be found in the "ToP Labels" section at <https://treeofphilosophers.it/labels>. Additionally, an upcoming issue of DR2 Working Papers will be dedicated to exploring these case studies in more depth.

¹⁰ "ProQuest Dissertations & Theses". <https://about.proquest.com/en/dissertations/>

from different sources is often a difficult task simply because we are not sure that they actually refer to the same people. Such attribution thus requires multiple validation steps that are hard, if not impossible, to formalize in a set of instructions. Two major issues that demanded our attention in the development of the Tree of Philosophers are the duplication and the overlapping of the personal identities of philosophers included in the Tree.

We find a partial solution to both problems by relying on virtual identifiers of authority data, which are resources used in archival disciplines and in library institutions. Virtual identifiers are simple numbers or strings of text that are used as labels or indexes, directing to a specific person identified as the author of a number of works. In order to mitigate the problems of duplication and overlapping of identities we made minor changes to the database, enlarging the Philosophers Table by adding four additional fields, one for each virtual identifier we chose to rely upon: these are Wikidata¹¹, ORCID¹², ISNI¹³ and VIAF¹⁴.

VIAF (Virtual International Authority File) is an international authority data identifier assigned by aggregating authority data from national library systems: this means that a name that is assigned a VIAF is a name that is recorded as the author of at-least-one work in at-least-one national library catalogue. ISNI is the ISO effort of standardisation of personal identification of contributors to the intellectual production and it works in a similar manner to VIAF, by aggregating authority data from national catalogues along with academic production of article-like works. Both OCLC's VIAF and ISNI aggregate authority data from national systems using samples of published titles and authors' birth (and sometimes death) years. ORCID identifiers are obviously available only for recent times, but their assignment is directly requested by researchers or institutions and they can help in disambiguating nodes in recent branches of the Tree of Philosophers, at the cost of an insignificant increase in the sparsity of the Philosophers Table in the database. Technically, ORCID is a part of ISNI, because ORCID identifiers are included as a region of ISNI identifiers. Nonetheless, we prefer to keep ORCID and ISNI ids as distinct fields. First, because a recent productive philosopher can easily have different ISNI and ORCID ids; secondly, because while ISNI IDs are assigned by aggregating data, the assignment of ORCID ids is directly requested by researchers or their institutions, so that the reliability of ORCID is greater than that of ISNI. Finally, Wikidata identifiers are assigned by an automatic system supervised by users of the Wikidata community. Noticeably, Wikidata ids are assigned to somewhat *notable* people so that we cannot expect Wikidata ids to make a huge difference in the disambiguation of non-famous philosophers.

The search for such different identifiers and, whenever available, their attribution to personal records in ToP's database, provide means to improve the way in which ToP works: the inclusion of four types of identifiers makes it possible for us to assess the population of the database at different stages, thus allowing for the evaluation of different strategies of data collection; we can evaluate the coverage of the database in terms of intra- or inter-disciplinary renown of philosophers (e.g. by comparing ISNI, ORCID and Wikidata coverage); furthermore, we are able to approximate a measure of the "Great Unread" that is included in the Tree of Philosophers, by measuring the philosophers that are not recorded in any of the mentioned repositories.

The assignment of virtual identifiers to personal records in ToP's database also improves ToP data in terms of findability, accessibility, interoperability and reusability [5]: if disambiguation allowed by the introduction of virtual identifiers trivially increases findability and accessibility of data, the indexation of philosophers' data with external identifiers dramatically improves interoperability, and consequently reusability. Indeed, reliance on external, widely used identifiers allows for the development of semi-automatic procedures for the inclusion of large quantities of personal records. As stated above, a variety of archival sources provide data about philosophers, and some of these already come in the form of structured data (mostly spreadsheet of archival records). In the best cases, structured data are clean enough to be added almost directly (after some filtering) in ToP's database. Without reliance on external identifiers, we could have done such an addition only if we were sure that no data that we would have added would have overlapped with personal data already present in the database, thus duplicating philosophers. This entails that when two sources of structured data concerning the same context are available, without relying on external identifiers we would have been forced to choose one of the two sources and discard the other. By contrast, reliance on external identifiers and on procedures for their attribution allows for the assignment of identifiers to the structured data to be added, and then for the application of filters in the identifiers' fields.

¹¹ "Wikidata". https://www.wikidata.org/wiki/Wikidata:Main_Page

¹² "ORCID". <https://orcid.org/>

¹³ "What Is ISNI". <https://isni.org/page/what-is-isni>

¹⁴ "VIAF". <https://viaf.org/>

5. INFRASTRUCTURAL INTEGRATION OF ToP – LOD

ToP is going to be one of the pilot projects to be included in the H2IOSC – Humanities and cultural Heritage Italian Open Science Cloud research ecosystem¹⁵ that is being developed by CNR. Under a collaboration agreement between the institute coordinating the Italian node of OPERAS¹⁶ for CNR (Institute for European Intellectual Lexicon and History of Ideas¹⁷), the Tree of Philosophers project will contribute its results for publication on the platform, participating in the design phases of database models and templates as well as of data acquisition throughout 2024.

The H2IOSC project aims at supporting the transition of participating research infrastructures into a consistent and accessible ecosystem of resources and services providing FAIR data, by creating a federated cloud for historical research in the humanities and for cultural heritage management.

This cloud will offer researchers a single access point to advanced tools, datasets, services, and methodologies provided by ToP and other participating infrastructures, enabling research teams to process, enrich, analyse, and compare research data beyond the boundaries of individual repositories or institutions.

From a practical point of view, the contribution of ToP data to the H2IOSC infrastructure ensures the possibility of their long-term maintenance by an extended ecosystem, rather than relying on the additional, unspecialised (and usually voluntary) work of ToP collaborators.

Moreover, the inclusion in such a large ecosystem of research infrastructures is going to have significant impact on the accessibility and reliability of ToP data for research purposes. Indeed, H2IOSC will provide a stable platform for the publication and management of data, along with means for semi-automatic FAIRness assessment and FAIRification of new data. ToP open data are going to be stored in rdf format, allowing for SPARQL querying¹⁸, and they will be linked with different data created in the context of other research endeavours.

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¹⁵ “H2IOSC - CNR”. <https://h2iosc.oivi.cnr.it>

¹⁶ “OPERAS – Open scholarly communication in the European research area for social sciences and humanities ”. <https://operas-eu.org/>

¹⁷ “ILIESI Istituto per Il Lessico Intellettuale Europeo e Storia Delle Idee - CNR”. <https://www.iliesi.cnr.it/index.php>

¹⁸ “SPARQL 1.1 - Overview”. <https://www.w3.org/TR/sparql11-overview/>

¹⁹ “Distant Reading and Data-driven Research in the History of Philosophy | The Blog of the DR2 Research Group of the University of Turin”. <https://dr2blog.hcommons.org/>