

Extended abstract for the Conference
Graphs and Networks in the Humanities

Understanding the Italian Academic Movement (1450-1700): from Paper to Relational Database to Graph

<https://graphentechnologien.hypotheses.org/>

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Amsterdam, February 2022

The following contribution offers a short summary of current tools to study the Italian academic movement¹ as a whole phenomenon, and introduces the recently developed graph that dramatically changes, and enhances, our understanding of the phenomenon, by answering questions that previous research tools are unable to answer.

The Italian Academic movement was one of the most influential social and cultural phenomena of the early modern period. Spontaneous associations of learned individuals, separated from universities, religious groups, or professional groups such as guilds, sprang among circles of humanists in early Quattrocento Tuscany, and spread to the rest of the Italian peninsula and then to Europe, to the point that by 1700, there were hundreds of academies, in big cities as well as in small centers.

Academies engaged in all sorts of disciplines, such as history, geography, poetry, music, theater, rhetoric, politics, diplomacy, medicine, mathematics,

¹The definition was used by Richard Samuels, “Benedetto Varchi, the Accademia degli Infiammati, and the Origins of the Italian Academic Movement,” *Renaissance Quarterly* 29 (1976): pp. 599–633, and Daniel Roche, “Prèmiere partie. Le mouvement acadèmiq. Fondations,” in *Le siècle des Lumières en province. Académie et académiciens provinciaux. 1680–1789*, 2 vols. (Paris: La Haye, 1978), vol. 1, pp. 15–185. For a more up-to-date critical bibliography, though limited to specific cities and selected subjects, see Simone Testa, “Academies.” *Oxford Bibliographies in Renaissance and Reformation*. ed. Margaret King (New York: Oxford University Press, 2019): <https://www.oxfordbibliographies.com/view/document/obo-9780195399301/obo-9780195399301-0428.xml>.

physics, engineering, etc., and generally promoted knowledge as a collaborative effort. While sociability² and oral communication were obviously crucial during their meetings, academies' outputs included networked publications, either in manuscript or in print, where the name of the academy and the names of academicians were proudly declared. In this way, academies highlighted the importance of belonging across intellectual circles, which made them more famous than other kinds of groups.

Despite their wide-spread and pervasive presence, the representation of Italian academies met both good and bad press.³ Lately, the phenomenon is being re-evaluated in light of current forms of social networks, and Social Network Analysis.⁴ Due to a number of different reasons, such as the difficulty of retrieving information, the bad press that for many decades the academic movement has received, and the difficulty of reconstructing complex and extended networks on the printed page, scholars have focused their attention on famous or exemplary instances. Thus, the attention on the whole phenomenon has diminished.

Academies on paper

Michele Maylender's five volume work *Storia delle accademie italiane* (1926 – 1930) offered the first history of each Italian academy, from the first instances to the end of the 19th century. However, Maylender had limited access to the sources, and the critical bibliography he could consult is now mostly out of date. Moreover, Maylender listed all academies by name, and indexed the academies by city at the end of each volume, which makes it difficult for scholars when they try to reconstruct the intellectual networks across the peninsula.

From 2006 to 2014, the Arts and Humanities Research Council, United Kingdom (AH/H023631/1), funded the project *Italian Academies (1525 – 1700): The first intellectual networks of Early Modern Europe*. The main output of the project is the Italian Academies Database (<http://www.bl.uk/catalogues/ItalianAcademies>).⁵

²Maurice Agulhon, "Introduction. La sociabilité est-elle objet d'histoire?," in *Sociabilité et société bourgeoise en France, en Allemagne et en Suisse (1750–1850)*, ed. E. François (Paris: Editions Recherche sur les civilisations, 1986), pp. 13–23.

³PAOLO PROCACCIOLI, *Un pregiudizio lungo due secoli. Per una rilettura delle accademie d'antico regime*, in *L'Italianistica oggi: ricerca e didattica, Atti del XIX Congresso dell'ADI*, a cura di B[eatrice] Alfonzetti et al., Roma, Adi editore, 2017, <http://www.italianisti.it/upload/userfiles/files/Procaccioli.pdf>.

⁴Lisa Sampson, "Finally the Academies": *Networking Communities of Knowledge in Italy and Beyond*, in *I Tatti Studies in the Italian Renaissance* (2020), pp. 369–381. Simone Testa, *Italian Academies and Their Networks, 1525–1700: From Local to Global* (Basingstoke, 2015), pp. 181 – 182, 237 – 238.

⁵This is an open access database hosted by the British Library. It was created by Simone Testa and Lorenza Gianfrancesco, and directed by Jane Everson, Denis Reidy, and Lisa Sampson, with the assistance of Tom Denman. The raw data are accessible at <https://data.bl.uk/iad>.

Academies in a database

The Italian Academies Database (IAD) is a digital resource based on prosopography, bibliography and hypertext. It allows the representation of the geography and history of Italian academies by linking academies, publications, cities, and people (in their various roles of academician, printer, author, dedicatee, contributor, engraver, censor, editor, and publisher), and solves the limits imposed by the printed page. The hypertext offers users an interactive tool to link to other information and offers a broader perspective on the Italian academic movement and its networks. So far, the IAD represents 22 cities, with 496 academies, and 905 publications related to the aforementioned academies. The number of academicians included thus far is over 4,000. Out of the 7,042 persons catalogued, the IAD list 527 authors, 1,793 contributors, 795 dedicatees, 217 editors, 396 printers, 73 publishers, and 549 censors. The structure of the relational database has significantly expanded and facilitated the research on the relations among the elements that make up the academic movement, allowing us to navigate from a general search term to specific entries. For example, if we search for the word “gelat*” (i.e. all the occurrences of the words beginning with “gelat”) we obtain the list shown in the figure below, where each item has a link to its full description.

The screenshot shows the 'DATABASE OF ITALIAN ACADEMIES' search results for the query 'gelat*'. The interface includes navigation links (About, Search tips, Advanced search, Main) and a search filter set to 'All item types'. The results are displayed in a table with the following columns: Item type, Name / Title, Location / Personal title / Title, and Date. Each row includes a 'Full' link to the item's description and a 'Tag' checkbox.


Item type	Name / Title	Location / Personal title / Title	Date
Academy	Accesi-Bologna (Accademia degli)	Bologna	1686-1699
Academy	Unanimi (Accademia degli)	Bologna	1670-1673
Person	Cospi, Angelo		1603-1671
Person	Zani, Andrea	Count Marquis	? - 1651
Person	Desideri, Girolamo		fl.1655-1692
Person	Zoppio, Melchiorre		1544-1634/7
Person	Argoli, Giovanni		1609-1660
Person	Balducci, Francesco		1579-1642
Person	Benigni, Domenico		?-1653
Person	Capponi, Giovanni		1586-1629
Person	Carracci, Agostino		1557-1602
Person	Dalla Corgna, Fabio		fl.1638-1642

Person

Surname: Carracci
 Forename: Agostino
 Gender: Male
 Personal title:
 Pseudonym:
 Anagram:
 Dates: 1557-1602
 Nationality: Bolognese
 Roles: Artist|Illustrator|Dedicatee
 Engraver reference: Dedicatee pp. 163-68
 Notes: Agostino was Annibale's brother and Ludovico's cousin. Agostino's association with the Gelati is doubt. Institute Critique (1995) pp. 122-23; agrees with Zappen. Agostino's portrait is in Malvasia, Felina 2

Academy

Name: [Gelati \(Accademia dei\)](#)
 City: [Bologna](#)
 Academician details:
 Nickname:
 Motto:
 Personal emblem:

Portrait image: 

Academy

Name: [San Luca \(Accademia di\)](#)
 City: [Bologna](#)
 Academician details:
 Nickname:
 Motto:
 Personal emblem:


Select role type:
 All

[Achille Bocchi Bonon. Symbolicarum Quaestionum](#)
[Bucrationi Amosae](#)
[Sime](#)
[L'Accademia d'Agostin Carracci](#)
[Prose de un'no in academi Gelati di Bologna](#)
[Memorie Inscritte a Fiorati de' Bologni Accademici Gelati di Bologna](#)

So for example, when we click on “Carracci, Agostino”, we enter into his personal page, and we see what academies he was linked to, and to what publications he was associated with.

By clicking on the first book in the list, we see that, despite he was not part of the Bocchiana academy, he contributed as an engraver to one of its publications, as shown below.

SE OF ITALIAN ACADEMIES


[rch tips](#) | [Advanced search](#) | [Main](#) 

Book full display

[Next](#)
 Book

Short title: Achille Bocchi Bonon. Symbolicarum Quaestionum
Full title: De universo genere quas serio iudebat libri quinque.
Academy: [Accademia Bocchiana](#)
Authors: [Bocchi Achille -1486-1562](#)
Publication year: 1574
Contributors:
Dedication place and year: 6th September 1574
Edition: 2 edn.
Censors:
Censors agreement: Curia Episc. et S. Inquisit. concessu
Shelfmark: 636.p.8
Subjects: Emblems|Poetry
Illustrations: Engravings | Emblems
Format: 4°
Emblem artist:
Pagination: pp. 362
Marginalia: No
Editors:
Dedicatee: [Bolognese Senate](#)
Engravers: [Carracci Agostino -1557-1602](#)
[Bonasconi Giulio -fl. 1531-1574](#)

Engraver reference:
Printers: [Societatem Typographicam Bononiensem](#)
Printer reference: Yes
Publisher (s):
Publication city: [Bologna](#) (Italian) [Bologna](#) (English) [Bononias](#) (Latin)
Fictitious publication city:
Essays:
Languages used: Latin|Greek
Notes: For full list book's images, and related texts (1574 edition), see The Study and Digitisation of 9 emblematicus. Studies in Neo-Latin Emblem Books, ed. K. Enekel and A Visser (Brepols, 2002).

Title page image: 

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[About search tips](#) [Advanced search](#) [Accessibility](#)
[Main](#) [Cpccr&h](#) © The British Library Board

The examples above show how we can surf the database through Academies, Persons and Books by following individual links.

Academies in a graph

Despite network and networking has long been recognized as a fundamental feature of the Italian academic movement,⁶ the relational database does not allow scholars to explore wider networks across the peninsula and through time, and thus visualize indirect relationships among academies, people, and books. For instance, the relational database does not allow to answer the following questions in an easy way:

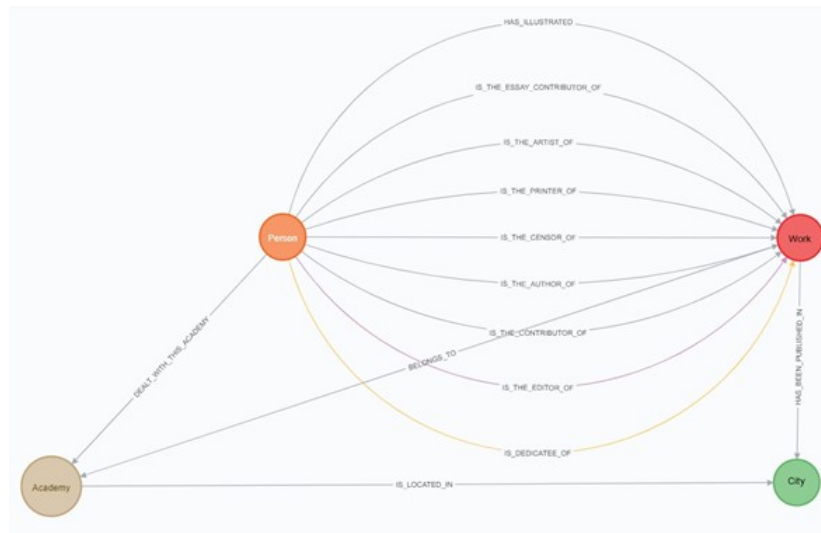
- How many Bolognese individuals were part of academies outside Bologna?
- What academy played a central role (they had more than N members) within a specific set of cities?
- How many books are the product of a collaborative effort between two or more academies?

This is why it has been useful to develop a graph model⁷ of the IAD, by using the Neo4j open software. The original data contained in the relational database, through successive transformations from the XML format provided by the British Library to a CSV format, has been converted into a graph, where it is easy to reconstruct the complex network of groups (namely the academies), individuals, and published books. By connecting in a graph people, academies, and books not directly connected to each other, it is possible to bring the study of the academic movement one step further than the relational database, allowing a better vision of the whole academic landscape.

Maintaining the same conceptual model of the IAD, where the main entities are Academies, Persons, Works and Cities, the nodes and relationships defined in the IAD Graph are shown below.

⁶Frances Yates, *The Italian Academies* (unpublished lecture delivered at Italian Summer School, Magdalen College, Oxford, August 23, 1949), accessible as Frances Yates, *Renaissance and Reform: The Italian Contribution* (London: Routledge, 1983), pp. 6–29; Eugenio Garin, “La letteratura degli Umanisti,” in *Storia della letteratura italiana*, ed. Emilio Cecchi and Natalino Sapegno, 9 vols. (Milan: Garzanti, 1965–69), vol. 3, *Il Quattrocento e l’Ariosto* (1965), p. 138; David Chambers, “The Earlier ‘Academies’ in Italy,” in *Italian Academies of the Sixteenth Century*, ed. David Chambers and François Quiviger (London: Warburg Institute, 1995), pp. 1–14; Marco Sgarbi, “What Was a Renaissance Academy? An Aristotelian Perspective.” *Archivum Mentis: Studi di filologia e letteratura umanistica* 6 (2017), pp. 263–288.

⁷As part of a MA thesis at the University of Pisa, by Alessio D’Arrigo, under the supervision of Vittore Casarosa and Simone Testa: Alessio D’Arrigo, *Le accademie siciliane nei secoli XVI – XVIII - Uno studio attraverso un database a grafo*, MA thesis (University of Pisa, 2021).



Thinking of the complete graph, where there is a node for each person and a node for each academy, it should be clear how easy it would be to obtain, e.g., all the persons associated with more than one academy, or all the publications associated with a given city. For each type of node also its properties have been defined, as shown in the table below, capturing all the information contained in the IAD database.

It is interesting to note that Neo4J allows the definition of properties for a relation, and in our case this possibility has proven useful in those cases where a person is associated with more than one academy. In the IAD, some of the personal characteristics of the association of a Person with an Academy depend on the Academy. For each person, the following three properties depend on the academy with which the person is associated.

- motto
- personEmblemDescription
- nickName_for_this_Academy

In the graph, this information has been captured as attributes of the relationship, allowing the definition of one single type of relationship between a person and an academy (Person – DEALT_WITH_THIS_ACADEMY → Academy), where the string in capital letters is the name of the relationship.

<p>Academy</p> <ul style="list-style-type: none"> • name • alternativeName • academyMotto • startDate • endDate • emblemDescription • notes • academyId <p>Person</p> <ul style="list-style-type: none"> • personalTitle • name • surname • pseudonym • anagram • gender • startDate • endDate • dateText • role • engraverReference • typographicReference • notes • cityId • nationality • personId 	<p>Work</p> <ul style="list-style-type: none"> • shortTitle • longTitle • essayTitle • subjects • illustration • marginalia • publicationYear • dedicationPlaceDate • citation • content • edition • language • pagination • censorAgreement • engraverReference • printerOrnament • notes • format • workId <p>City</p> <ul style="list-style-type: none"> • cityEnglishName • cityLatinName • cityItalianName • cityId
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To show the potentials of the graph database, we present here some graphs and the results returned by the IAD Graph, when submitting some of the queries mentioned before. The queries are in Cypher (the query language of Neo4J) and the number of nodes in some of the results has been limited for typographical reasons.

- How many persons are associated with more than one academy?

```

MATCH (p)-[r1:DEALT_WITH_THIS_ACADEMY]-(a:Person)-
[r2:DEALT_WITH_THIS_ACADEMY]-(s)
RETURN DISTINCT COUNT(a) as
Persons_belonging_to_two_academies_or_more

```

The answer to the above query is:
Persons_belonging_to_two_academies_or_more
2778

- How many publications were produced in Bologna?

```

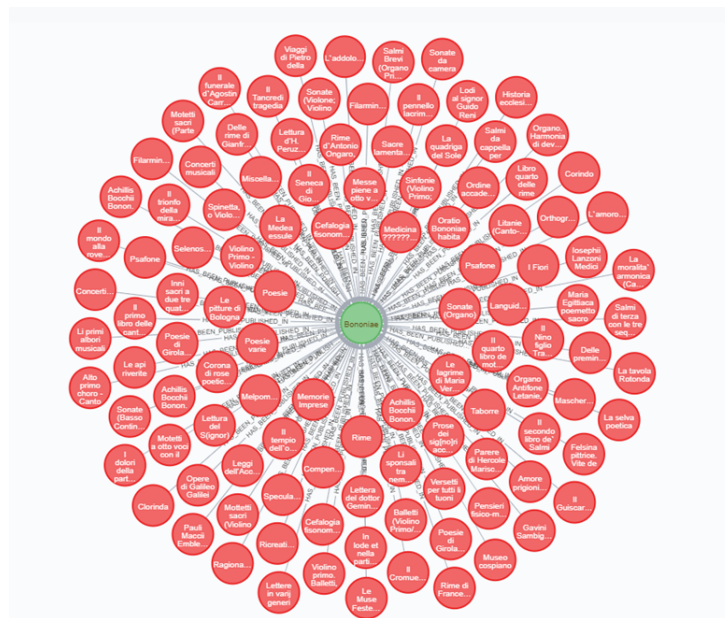
MATCH p=()-[r:HAS_BEEN_PUBLISHED_IN]->(c:City)
WHERE c.cityItalianName="Bologna"
RETURN COUNT(p) as Publications_in_Bologna
RETURN p

```

The answer to the above query is:

Publications_in_Bologna

110



- How many Bolognese individuals were part of academies outside Bologna?

```
MATCH p=(d:Person)-[r:DEALT_WITH_THIS_ACADEMY]->(a:Academy)-
[:IS_LOCATED_IN]->(c:City)
WHERE d.nationality="Bolognese" AND NOT c.cityItalianName="Bologna"
RETURN COUNT(DISTINCT d) as
Count_of_Academics, a.name as Academy,
COLLECT (d.name+" " +d.surname) as Academic_name,c.cityItalianName as City
ORDER BY COUNT(DISTINCT d) DESC
```

The first few lines of the answer to the above query are:

Count_of_Academics	Academy	Academics_name	City
14	"Incogniti-Venezia (Accademia degli)"	["Carlo Emanuele Vizzani", "Giovanni Francesco Negri", "Annibale Marescotti", "Cesare Rinaldi", "Clemente Moli", "Ridolfo Campeggi", "Andrea Barbazza", "Giovanni Bertolotti", "Giovanni Maria Vanti", "Girolamo Preti", "Claudio Achillini", "Giovambattista Capponi", "Francesco Carmeni", "Ovidio Montalbani"]	"Venezia"
8	"Umoristi (Accademia degli)"	["Berlingiero (juniore) Gessi", "Andrea Barbazza", "Vincenzo Maria Marescaldi", "Giovanni Valesio", "Alberto Caprara", "Girolamo Preti", "Carlo Antonio Manzini", "Ridolfo Campeggi"]	"Roma"
8	"San Luca (Accademia di)"	["Agostino Carracci", "Francesco Albani", "Elisabetta Sirani", "Annibale Carracci", "Lavinia Fontana", "Agostino Metelli", "Lodovico Carracci", "Alessandro Algardi"]	"Roma"
4	"Ricovrati (Accademia dei)"	["Fabio Albergati", "Domenico (Bolognese) Guglielmini", "Valerio Zani", "Luigi Ferdinando Marsili"]	"Padova"
4	"Intrepidi (Accademia degli)"	["Claudio Achillini", "Giovambattista Capponi", "Ippolito Nanni Fantuzzi", "Girolamo Desideri"]	"Ferrara"

- What academies had more than 50 members within a specific set of cities (e.g. Venezia and Padova)?

```
MATCH q=(p:Person)-[r:DEALT_WITH_THIS_ACADEMY]->(a:Academy)-
[:IS_LOCATED_IN]->(c:City)
WITH COLLECT(DISTINCT p.personId) AS people,
COUNT (DISTINCT p.personId) AS Academics_number,
COUNT (*) AS occ, c, c.cityItalianName AS Location_City, a
WHERE c.cityItalianName in ["Venezia", "Padova"] and occ >50
RETURN Academics_number, a.name as Academy_name, Location_City
ORDER BY Academics_number DESC
```

The answer to the above query is:

Academics_number	Academy_name	Location_City
399	"Ricovrati (Accademia dei)"	"Padova"
149	"Incogniti-Venezia (Accademia degli) "	"Venezia"
136	"Argonauti-Venezia (Accademia degli)"	"Venezia"
68	"Veneziana (Seconda Accademia)"	"Venezia"
59	"Delia (Accademia)"	"Padova"

- How many books are the product of a collaborative effort between two or more academies, and what are they?

```

MATCH (a:Academy)-[ ]-(w:Work)
WITH COLLECT(distinct a.name) AS Associated_academies_for_this_book,
     w.shortTitle AS Book_short_title, w.workId AS Book_ID,
     COUNT (*) AS occ, w
WHERE occ >= 2
RETURN COUNT(w) AS Total_countBooks_belonging_to_more_than_one_academy
RETURN Associated_academies_for_this_book, Book_short_title, Book_ID

```

The total number of books is here below, followed by just the beginning of the table containing all the books related to two or more academies.

Total_countBooks_belonging_to_more_than_one_academy
1
94

Associated_academies_for_this_book	Book_short_title	Bool
["Gelati (Accademia dei)", "Spensierati (Accademia degli)"]	"Lettere di Cesare Rinaldi"	591
["Gelati (Accademia dei)", "Fantastici (Accademia dei)"]	"Bibliotheca romana"	724
["Gelati (Accademia dei)", "Informi-Ravenna (Accademia degli)"]	"Oratio Bononiae habita"	733
["Gelati (Accademia dei)", "Ardenti (Accademia degli)"]	"Pauli Maccii Emblemata "	29
["Gelati (Accademia dei)", "Selvaggi (Accademia dei)"]	"Filarmino favola pastorale"	15
["Gelati (Accademia dei)", "Incitati (Accademia degli)"]	"Il convito ovvero Discorsi di quelle materie che al convito s'appartengono. "	511

Conclusions

To conclude, the IAD Graph allows users to interrogate the IAD relational database and answer complex questions, which neither the paper or the relational database can answer. Moreover, the IAD Graph visually reveals the mobility, and the network underpinning the academic movement, and reconstructs the “intellectual life of small groups, circles, networks, or ‘epistemological communities’ viewed as the fundamental units which construct knowledge and direct its diffusion through certain channels.”⁸ While we usually underline the serious aspect that underpins the circulation of knowledge, we should always remember that the foundation of such groups as the academies originates in the implementation of learned sociability, often associated to conviviality, in the typical Renaissance imitation of ancient Greek and Roman models. Thus, IAD Graph sheds light on how to interpret the whole academic movement in light of social network analysis, by exalting the surface of the relations among individuals. Through the implementation of a graph database, users can both actively reconstruct and demonstrate their results about the large and complex knowledge network that anticipated the European Republic of Letters. Thus, we can confirm that Graph is knowledge.

⁸Peter Burke, *A Social History of Knowledge: From Gutenberg to Diderot* (Cambridge, UK: Polity, 2000), p. 8.

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