

# A Computational Analysis of Gratian's *Decretum* (c. 1140)

**Student Name(s):** Jake Bayon

**Department:** Computer Science

**Faculty Mentor Name(s):** Dr. Paul Evans



## **Project Abstract:**

In the expanse of medieval history, amidst the crisis of the church and state, Gratian emerges as a pivotal yet often overlooked figure, renowned for his pioneering work in canon law. His seminal text, *Concordia Discordantium Canonum* (*The Harmony of Discordant Canons*), commonly known as the *Decretum*, brought order to the cacophony of contradictory laws within the Catholic church that had accumulated over centuries. The discovery of the text's first recension—an earlier edition that is approximately half of the size of its more widely known counterpart—has opened new avenues of inquiry. Our research delves into the evolution of Gratian's magnum opus, particularly exploring the topical differences between its first and second recensions. Through computational analysis techniques such as lemmatization, we aim to unravel the linguistic and doctrinal shifts between these editions of Gratian's work. By mapping Latin words to their root forms, we seek to uncover subtle nuances between the texts, shedding light on its structural evolution and enduring relevance. This interdisciplinary approach merges historical inquiry with technological innovation, offering new insights into Gratian's legacy and his impact on Western law and Catholic ecclesiastical jurisprudence.





# THE INVESTITURE CONTROVERSY

1046 - 1122



# *CONCORDIA DISCORDANTIUM CANONUM*

(Gratian's *Decretum*) c. 1140





## EXPLORER

## PROBLEMS

## OUTPUT

DEBUG CONSOLE

## TERMINAL

## PORTS

GRATIAN101

&gt; ima

## > Resources

```
> venv
```

work

▼ corpora

```
> final
```

- final\_lemmas

dePen.txt

Gratian0.txt

Gratian1.txt


Gratian2.

example.py

```
≡ exceptions.txt
```

lemmatize.py

📖 README.md

 works.py

## ◆ .gitignore

```
≡ exceptions.txt
```

📁 Jake.md

- list\_of\_lemmas

Paul.md

➦ `practice.py`

 README.md

[regex.py](#)

```
/Users/jakebayon/Desktop/research/Gratian101/venv/bin/python /Users/jakebayon/Desktop/research/Gratian101/list_of_lemmas  
(venv) jakebayon@Jakes-MacBook-Pro-2 Gratian101 % /Users/jakebayon/Desktop/research/Gratian101/venv/bin/python /Users/  
jakebayon/Desktop/research/Gratian101/list_of_lemmas  
['superfluitas', 'illudio', 'quatuor', 'Athanasius', 'clero', 'Teodoricus', 'uenerabilis', 'Simachus', 'impingo', 'Liguri  
o', 'Simachus', 'Simachus', 'satisfacio', 'Laurentius', 'subscribo', 'subscribo', '65', 'dispensatio', 'Simachus', 'sub  
us', 'instante', 'Bracharensis', 'Dalmaticus', 'Aregius', 'crismo', 'liquor', 'perungo', 'Radolphus', 'coma', 'sphaer  
s', 'purgatorius', 'stipula', 'securitas', 'transitorius', 'intellectus', 'karis', 'blandior', 'transitorius', 'minutus2  
replico', 'minutus2', 'expedio', 'importune', 'exaspero', 'prandeo', 'somnus', 'tarde', 'surgo', 'carcer', 'tarde', 'inf  
dicus', 'Ieronimis', 'Bigamus', 'superstitio', 'Catholici', 'detestacio', 'simoniacus', 'semis', 'contrarietas', 'conte  
usl', 'precaueo', 'caterizo', 'rudisi', 'celeber', 'infirmus', 'moralia', 'dilector', 'extraneus', 'Rabanus', 'Heribald  
us', 'mancipium', 'Libertinus', 'Eliberitanus', 'Nucerianus', 'Martir', 'uisitacio', 'laicus', 'Ezechias', 'dissipo', 'e  
'Nicenus', 'prefatio', 'saluto', 'unigenitus', 'obumbratio', 'lumen', 'interpono', 'greco', 'tenuiter', 'latinus', 'f  
enarius', 'quadringentimimus', 'Peus', 'octoginta', 'indictio', 'separatim', 'nonagenarius', 'Benedictus', 'Aprilis', 'O  
'releuatio', 'asperere', 'Antemius', 'Subdiaconus', 'Campania', 'canicies', 'liberalitas', 'dispergo', 'orphanus', 'implo  
'limen', 'calceo', 'mapulus', 'Subdiaconus', 'sedo', 'lino', 'infirmus', 'saluo', 'infirmus', 'infirmus', 'Crisma', 'plo  
ensis', 'reor', 'ualurus', 'Ennigil', 'sil', 'esco', 'Corne', 'omuni', 'que', 'uenie', 'cen  
iani', 'convulum', 'L', 'abito', 'urpianus', 'castio', 'recipio', 'mediar', 'diro', 'Xq  
tus', 'interfu', 'alato', 'alor', 'campia', 'Xqlu', 'oreuicaco', 'oreuicaco', 'uaricator  
'secluso cultum', 'quid', 'audico', 'precricor', 'colono', 'ablicio', 'ali', 'proptim', 'pro  
'Antoninus', 'Caedens', 'terrum', 'feruens', 'uibertus', 'zetotopia', 'spontaneous', 'guarmaciens', 'ugiller', 'con  
s', 'prefectus', 'pretorius', 'litigator', 'audientia', 'contestatio', 'provocatio', 'biennium', 'Autentici', 'collatio'  
us', 'lapsus', 'Creuius', 'prologus', 'biblioteca', 'digero', 'conceptio', 'Titius', 'Meuia', 'Seius', 'Numerius', 'Num  
modol', 'dispergo', 'patrimonium', 'dilapidatio', 'utur', 'rat', 'suspectus2', 'tutela', 'suspectus1', 'pressite  
plenarius', 'condido', 'peticius', 'collatio', 'procto', 'camio', 'contesor', 'collatio', 'exinde', 'sportula', 'fid  
ntestor', 'dilatorijs', 'inicium', 'peremptorius', 'procto', 'ptique', 'subrogatio', 'Brittis', 'surdus', 'delegati  
caudex', 'Ciuilis', 'intermitto', 'liberalis', 'prebens', 'liberalis', 'delator', 'emergo', 'familiaritas', 'inhersum',  
cialis', 'presis', 'citra2', 'caudem', 'famosus', 'impe', 'famosus', 'publicum', 'ignarus', 'sin', 'cartula', 'subiugo'  
impe', 'Gratianus', 'caudem', 'accusso', 'inexpletus', 'psallo', 'obrepo', 'archidiaconatus', 'tutus', 'submitto', 'spo  
o', 'sustineo', 'draco', 'adiutorium', 'insanabilis', 'obstinatio', 'admisce', 'peruerse', 'Abel', 'rennuo', 'ferrum',  
imiter', 'Diaconus', 'Dialogorus', 'yconomos', 'inalitudo', 'sublimis', 'Theodosius', 'antiquo', 'caudem', 'capitularis  
sane', 'Richardus', 'uito', 'notatio', 'limen', 'refrinio', 'esus', 'engiltardo', 'Boson', 'uocabulum', 'Uarensis', 'sa  
ontracto', 'indico?', 'Frontarius', 'Burdegalemsis', 'Maximianus', 'inuado2', 'digesti', 'prefectus', 'inofficiosus', 'c  
iugo', 'uerbero1', 'sum', 'Antoninus', 'Montanus', 'Thomas', 'uicissim', 'resarcio', 'Deuteronomius', 'illuc', 'famula',  
heodosius', 'tristo', 'desperatio', 'dormio', 'contristo', 'humanitas', 'afflictus2', 'patibulum', 'magonsiensis', 'cont  
latio', 'uacatio', 'Theodosius', 'tenor', 'perpensum', 'moderatio', 'perscribo', 'depello', 'faex', 'extraordinarius', '  
um', 'deportatio', 'uro', 'hostiarium', 'tugurium', 'rusticanus2', 'suffarcino', 'famelicus2', 'fastidio', 'eximo', 'Ben  
'detentio', 'commodum1', 'creditor', 'indistinctus', 'commodum1', 'decennium', 'Uicennius', 'tricennium', 'interruptio'  
'presides', 'depropero', 'presso', 'tabularius1', 'tabularius1', 'interruptio', 'curro', 'Autentici', 'secludo', 'decen  
'Theodosius', 'emphiteoticarius', 'repubblica', 'perperam', 'officio', 'comparator', 'Autentici', 'collatio', 'decenna  
tus1', 'violentus', 'clericum', 'pecuniarius2', 'pecuniarius2', 'querimonia', 'eximo', 'importo', 'instar', 'digero', 'p  
as', 'sanctimoniam', 'Eutyrianus', 'conductio', 'Nicasis', 'Culusitanus', 'fallos', 'fallos', 'fallos', 'fallos', 'fallos',  
us', '26', 'medardus', 'predestino', 'obduratio', 'predestinatio', 'prescientia', 'predestinatio', 'fallos', 'predestino',  
io', 'gradior', 'gradior', 'tametsi2', 'contueor', 'nocio', 'absolutus', 'proculdubium', 'existio', 'indignatio', 'indign  
tas', 'penetro', 'Tyrii', 'Sydonii', 'Corozai', 'Bethsaida', 'sepia', 'spina', 'munia', 'quadra', 'lubricus', 'incongrue  
cius', 'lindepinus1', 'inopetialis', 'propagatio1', 'inoperari', 'didical', 'ligall', 'Marxianus', 'Constantiu', 'laud
```

