

Text-To-Image Alignment on Chant Manuscripts

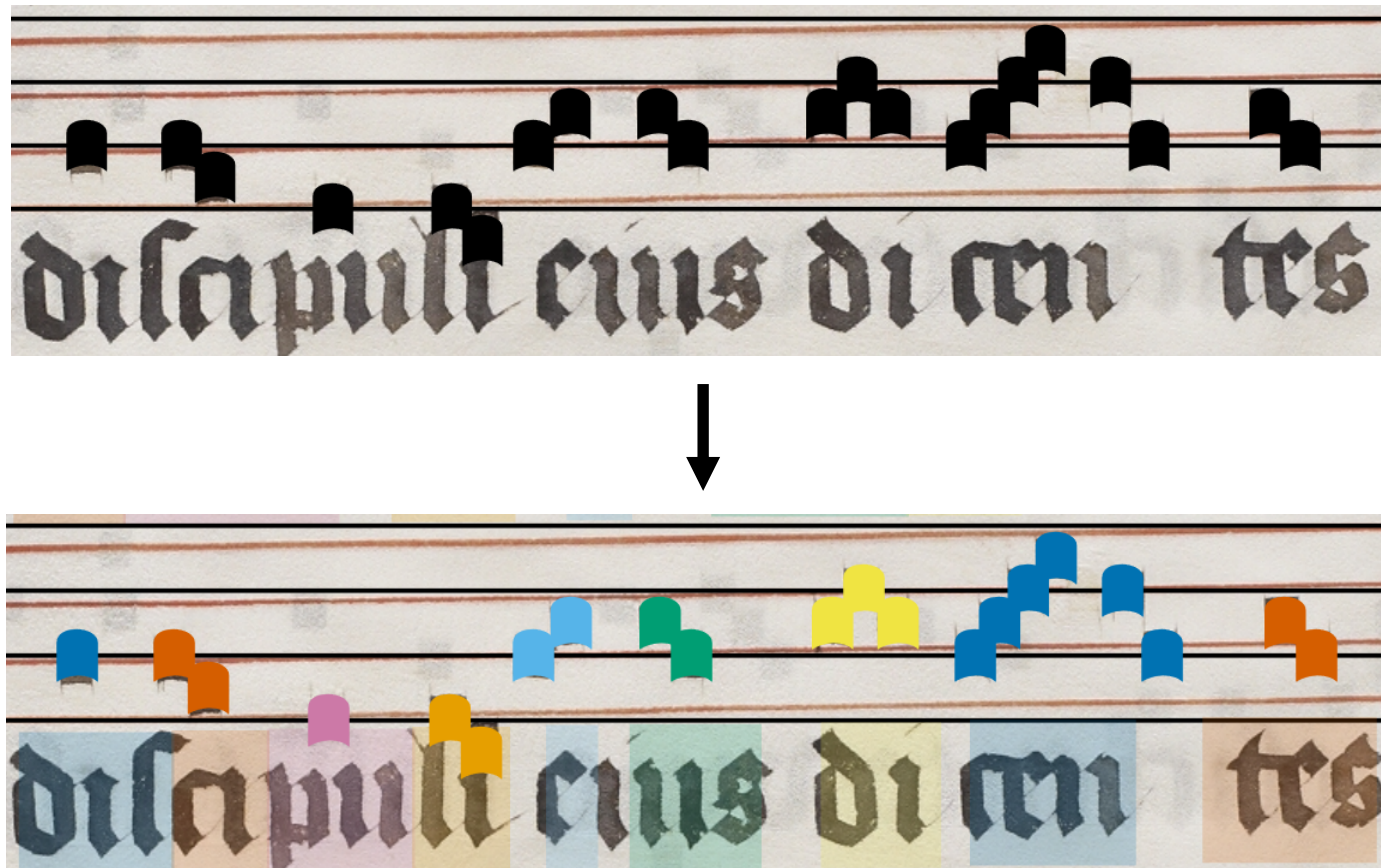
Tim de Reuse

SIMSSA Workshop XIX

21/09/2019

Associating Neumes with Syllables of Text

- Neume notation is syllable-based
- Optical Character Recognition (OCR) on handwritten sources is difficult!
- Often have text transcript, but need location of each syllable



Using an Imperfect OCR

- Transcript gives us perfect transcript, no position information
- OCR gives us incorrect transcript, some position information
 - Combine these two sources of information
- We train an OCR system on ~2100 words from Salzinnes manuscript
 - ~80% per-character accuracy

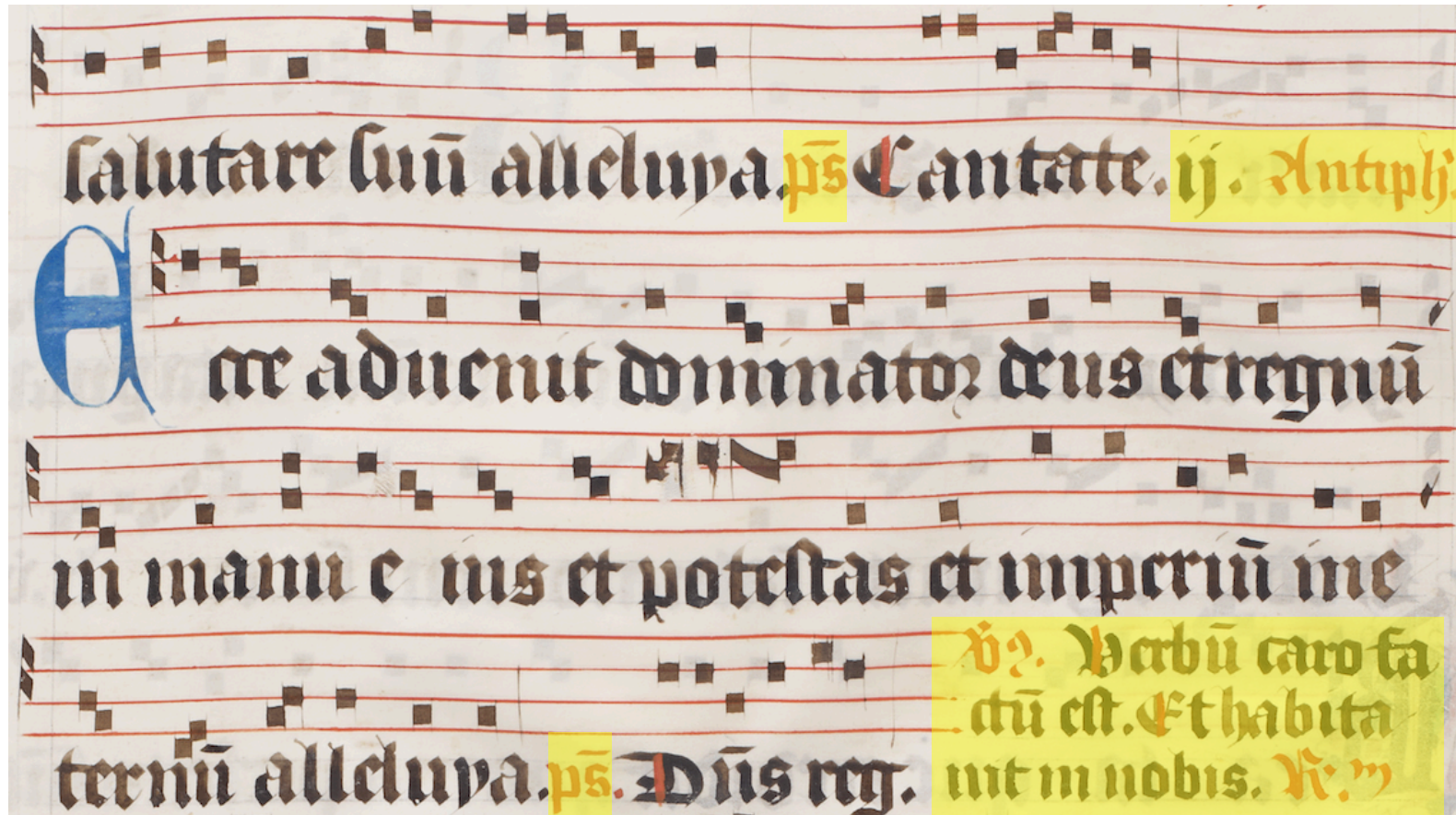
TRANSCRIPT:

salutare suum alleluya cantate
ecce advenit dominator deus et regnum
in manu ejus et potestas et imperium in e

ternum alleluya dominus regit

OCR:

salutare suum aleluya.ps Cantate.n. Antipll.
ece adnenit domrnator deus et regnum
im manu e ns et potestas et immperum ime
~vus. Verbum caro fo
ctum est. Et habita
ternum alleluya.ps. Dominus reg. int im nobis.



Non-chant Text

Affine Needleman-Wunsch Algorithm

- Given two sequences, make them line up with as few “edits” as possible
 - Minimize gaps and mismatches, maximize matches

The OCR gets many characters wrong, but the incorrect character is aligned to the correct one in the transcript

TRANSCRIPT: salutare suum alleluya__ cantate__ _____ecce advenit dominator
OCR: salutare suum a_leluya.ps Cantate.n. Antipll.e_ce adnenit domrnator

↓

deus et regnum in manu ejus et potestas et i_mperium i_____n
deus et regnum_im manu e ns et potestas et immper_um imevus. Verbum carofoctum

↑

e_____ternum alleluya__ dominus reg__i_t
est. Et habitaternum alleluya.ps. Dum___s reg. int

Non-chant text picked up by the OCR
is aligned with gaps in the transcript

sa lu ta re su um al le lu ya can ta te

salutare suū alleluia ps Cantate. ij. Antiph.

ecce ad venit do mi na tor de us et reg num

Ecce advenit dominator deus et regnū

in ma nu e jus et po te stas et im pe ri um

in manu eius et potestas et imperiū in

in e. Verbū caro fa

ctū est. Et habita

ter num al le lu ya

ternū alleluia ps. Dominus reg. nit in nobis. R. 22

in no va bit te do lor sal va bo te et li be ra bo te no li ti me re
In nouabit te dolor Saluabo te & liberabo te noli timere
is ra hel si me au di e ris non e rit in te de us re cens ne que a do
Ū Israel si me audieris non erit in te deus recens Neq' ado
ra bis de um a lie num e go e nim do mi nus sal
rabis deum alienum ego enim dominus. SALUABO

ui am do mi ni re ctas fa ci te se mi tas dei nost ri
uiam domini rectas facite semitas dei nostri. f. f. r. ii
ec ce mit to an ge lum me um qui pre pa ra bit vi am
Ū Ecce mitto angelum meum qui preparabit uiam
tu am an te faci em tu am. Ū Syon re noua be ris et vi
tuam ante faciem tuam. Ū Syon renouaberis & ui

Thank you!



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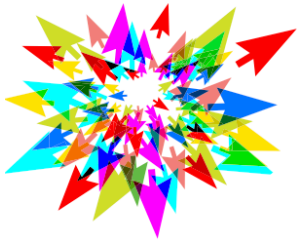
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