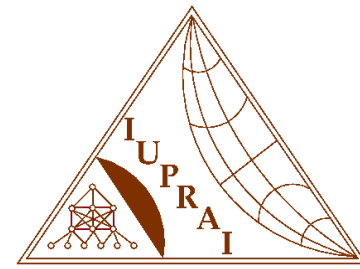




ICVGIP 2016



Generating Synthetic Handwriting using n-gram letter glyphs

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Presented by: Arka Ujjal Dey

The Handwriting Synthesis task

salmonella



Character model

salmonella



Character model + Ligature model

Synthesis Using only glyphs

salmonella



s-a-l-m-o-n-e-l-l-a

salmonella



s-al-m-on-e-l-l-a

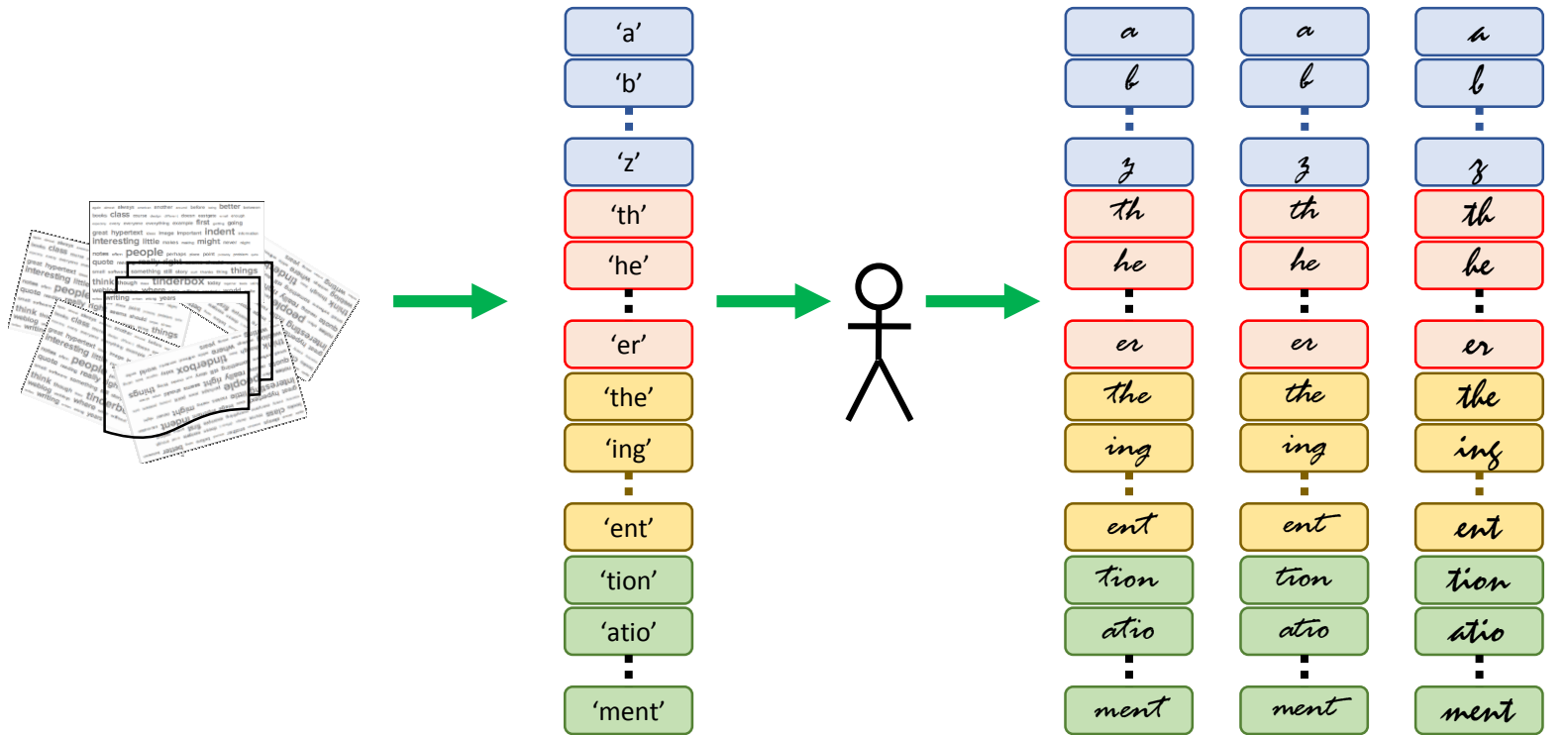
salmonella



s-al-m-one-l-l-a

With **multi-letter** glyphs ligature comes for free

Offline pipeline



corpus

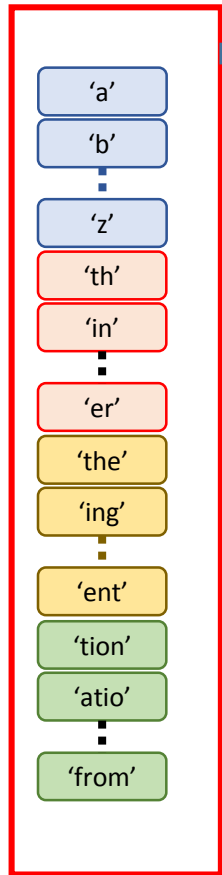
lexicon

glyph dataset

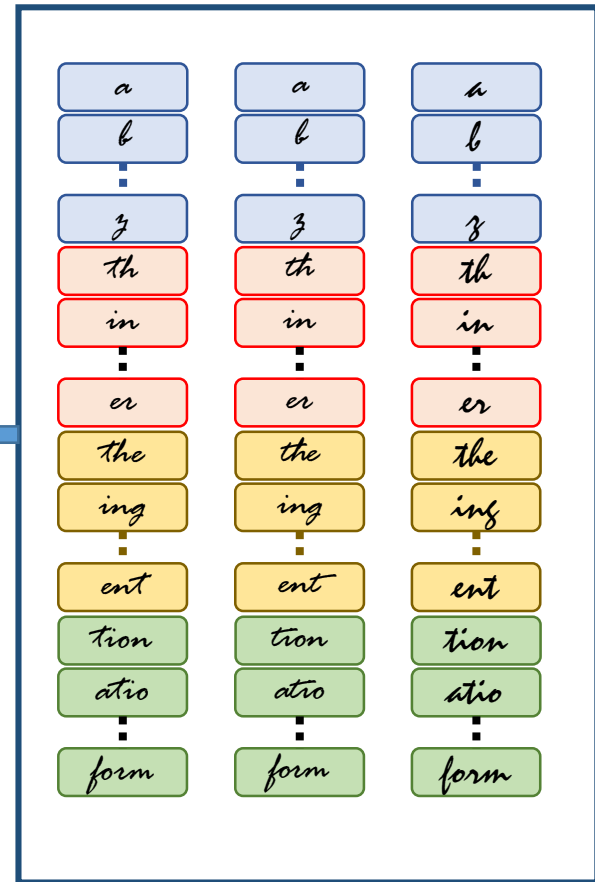
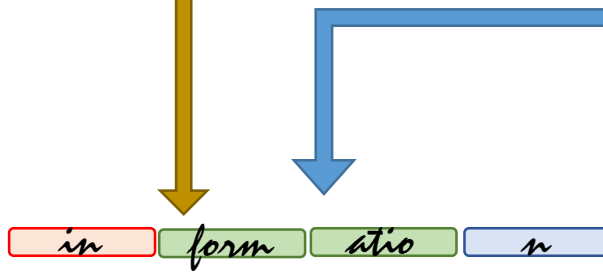
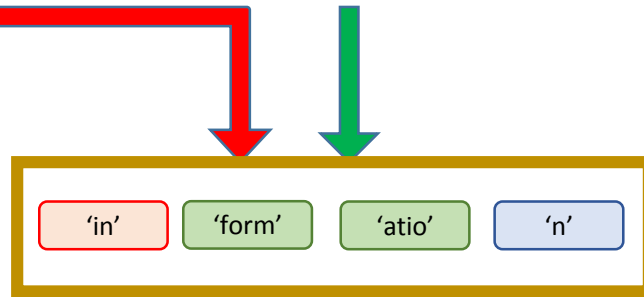
example

text

'information'

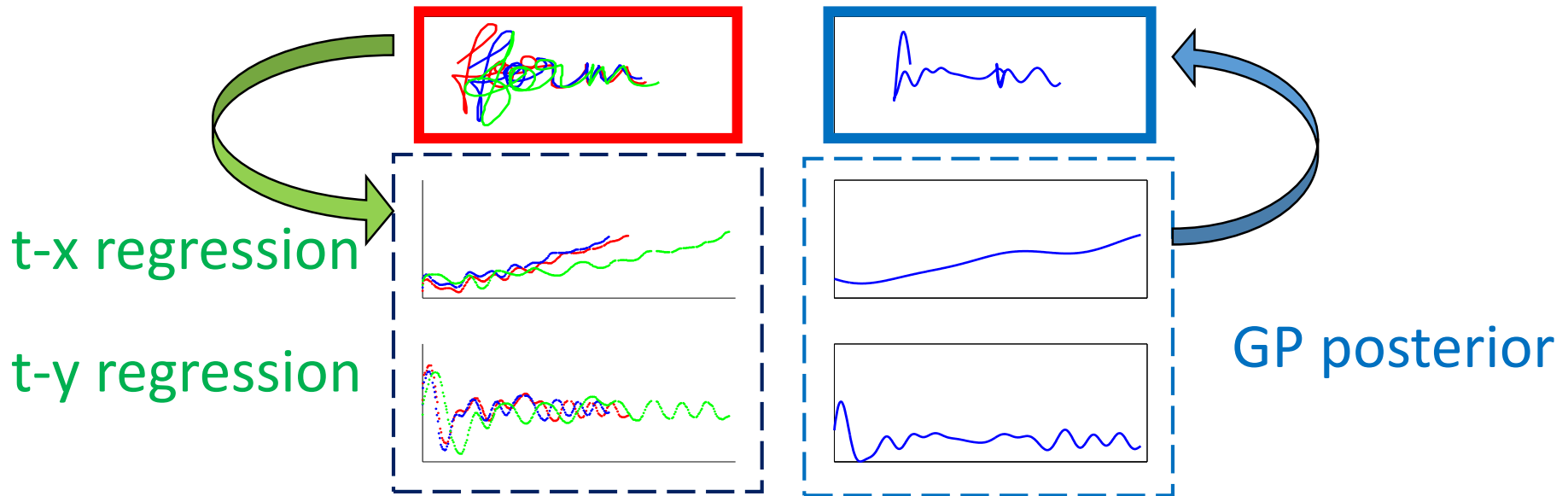


lexicon

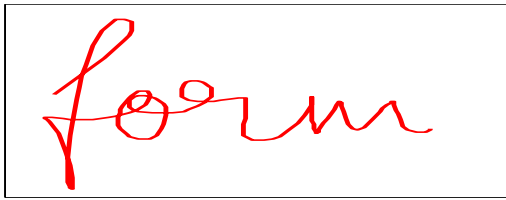


glyph dataset

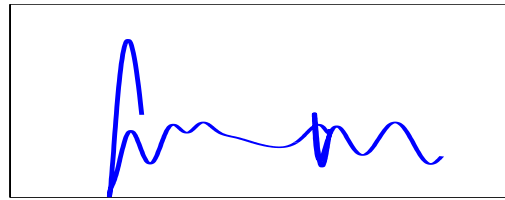
From **samples** to Perturbation: **GP regression**



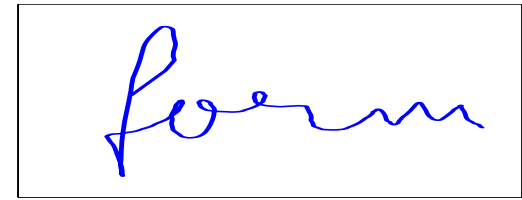
From Perturbation to Generation



random seed

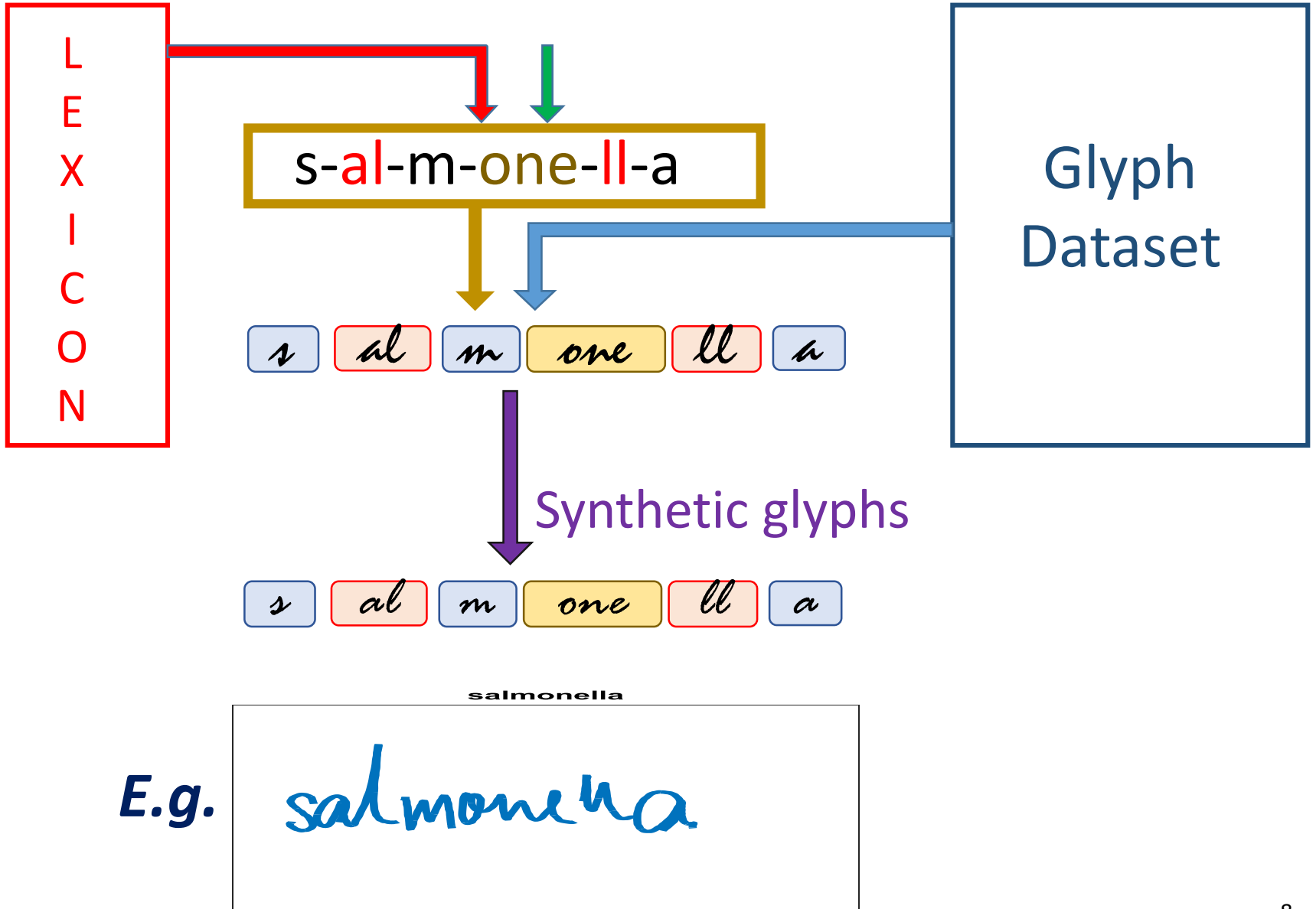


Perturbation



Synthetic glyph

Text: salmonella



Spline based *ligature* model

..(1)

salmonella



salmonella

The image shows the word 'salmonella' written in a blue, cursive script. Each letter is a separate, distinct glyph, with clear gaps between them. This represents a simple glyph alignment model.



salmonella



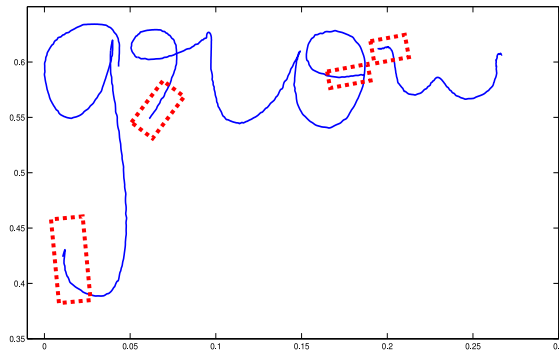
salmonella

The image shows the word 'salmonella' written in the same blue, cursive script. The letters are now connected together, forming a single, continuous ligature. This represents a spline-based ligature model.

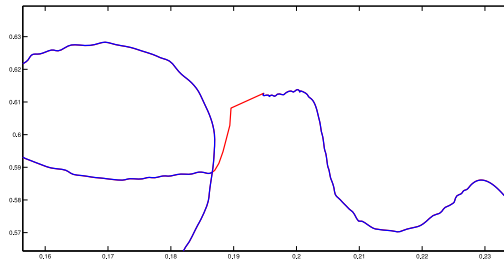
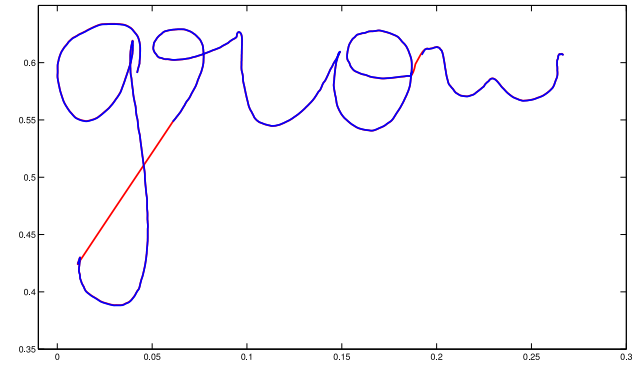
from simple glyph alignment to ligature

Spline based ligature model

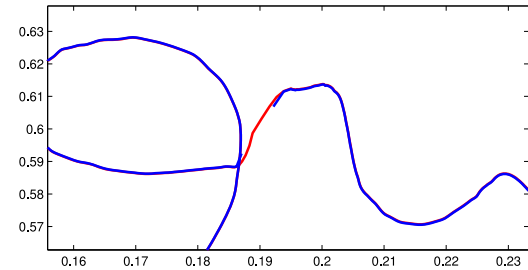
..(2)



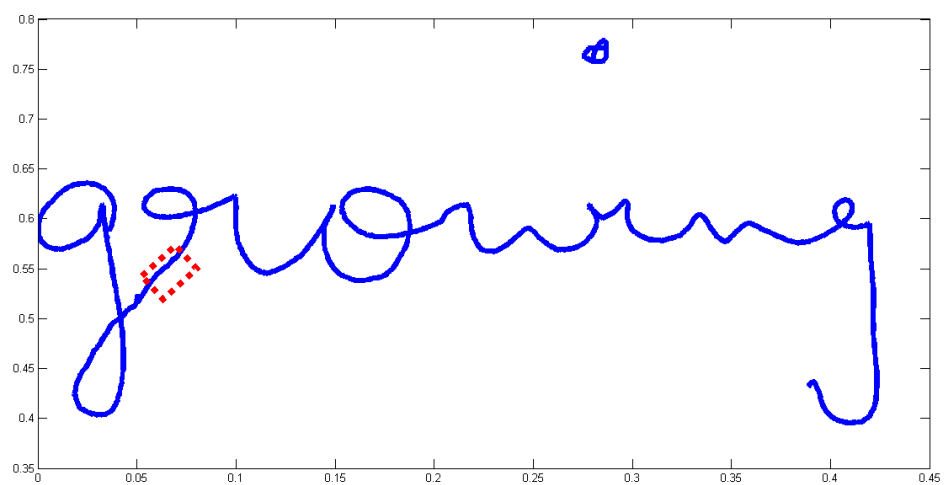
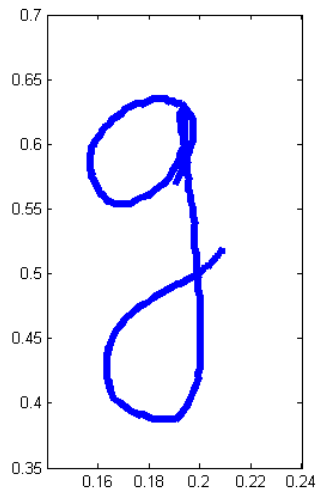
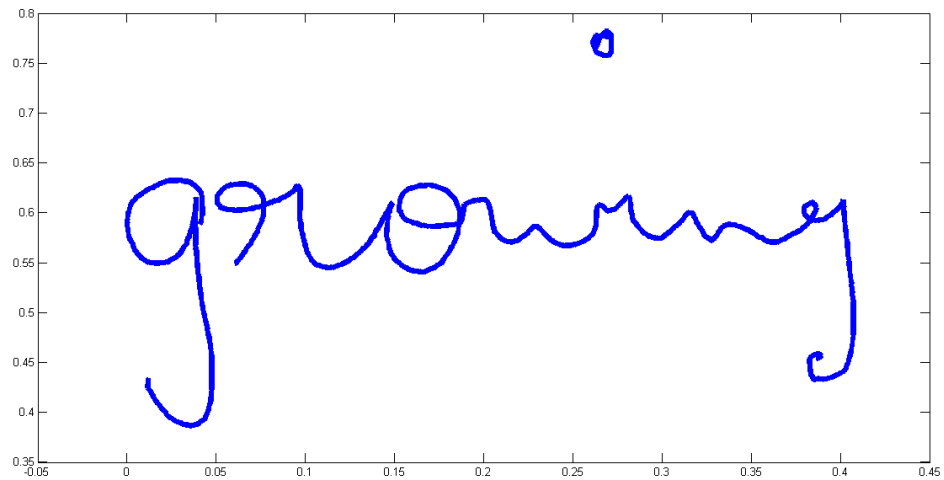
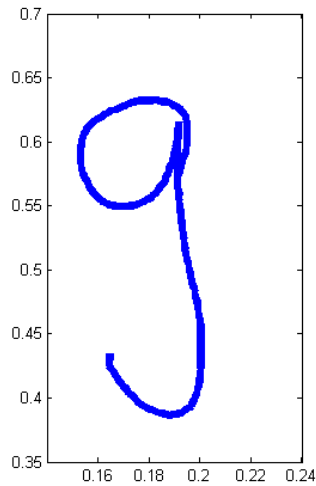
stitching



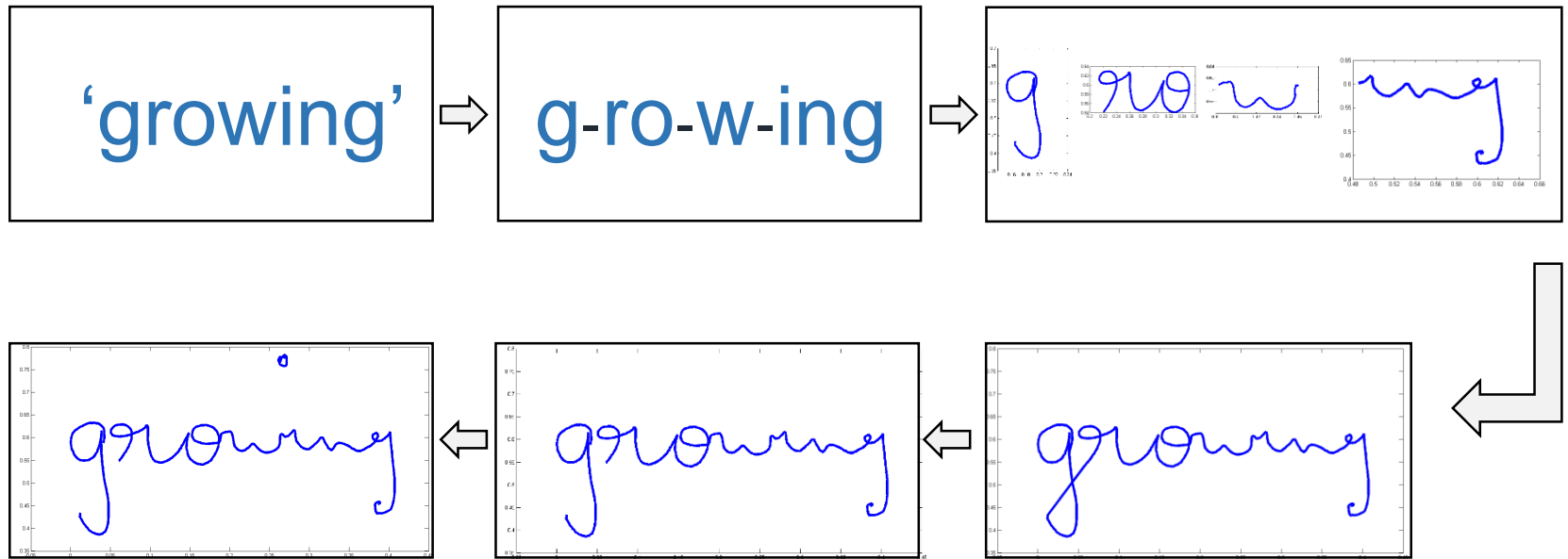
smoothing



Pen lift, when **not** to connect



Online Pipeline



Can sum of parts be the whole?

acceptance

acceptance

homecoming

homecoming

Constraints

- Glyph input method
- Alignment issues
- Ligature is basic

Summary

- **Extended lexicon** captures **language statistics**
- **Data driven** synthetic glyphs are **consistent**
- N-gram glyphs minimizes ligature
- lexicon size, and ligatures required are inversely related
- **Basic ligature** scheme
- Natural looking semi cursive script