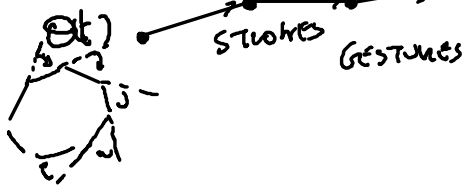
I. BITMAP

II. STROKE ... - SEQUENCE (t)
- PEN PRIMITIVES

INTERACTIVE EVENT SEQ
- MOUSE DOWN (t, x, y)
- MOUSE MOVE (t, Δx, Δy)
- "
- "
- MOUSE UP (t, x, y)

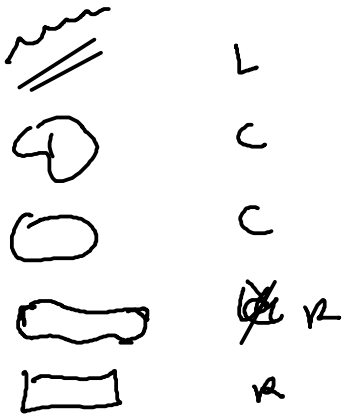


- PRE-PROCESS: FILTER / SMOOTH / ...
  - XOUTLIERS
  - MOVING AVERAGE
- Θ_s : 20°, 20°, 19°, ---
- $\Theta(t)$, $\forall t$: SAME SIGN, MAGNITUDE
- "FEATURES"

A. OFFLINE SHAPE RECOGN.

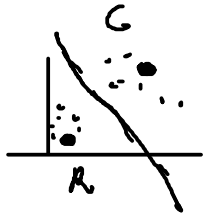
B. ONLINE SHAPE RECOGNITION

SET OF PRE-DEFINED SHAPES (DSL) [1]
- EXTENSIBLE

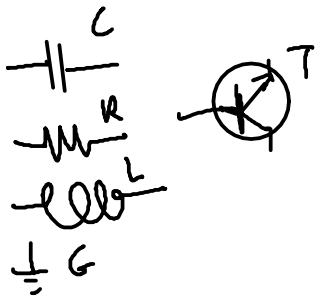


α. GRAMMAR (RULES)

B. PATTERN RECOGNITION (TRAINING SET)
- SVM SUPPORT VECTOR MACHINES (VAPNIK)
- NN



(1)



WHY?: DSL
- DO ?
- ELECTRICAL

COMPILERS

INTENSIONAL — EXTENSION

⟦ "A+B*" ⟧ REG EXP = { "A", "AA", "AAA", ..., "AB", "ABB", ... }

"A+B*": "+" META CHAR, "*" META CHAR; REG EXP META LANG.

REGEXP → FSA → CODE

LEXER

LANGUAGE ID

<ROOT> := "[" ID <BODY> "]"

ID: TOKEN

<BODY> := [<STATEMENT>] | <STATEMENT> <BODY>

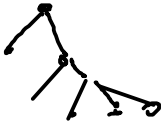
[ ]: OPTIONAL

<STATEMENT> :=

"[AA a:2; a:b;]"

PARSE TREE

AST

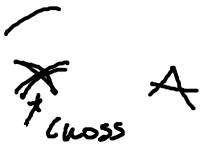
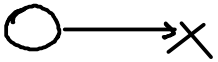


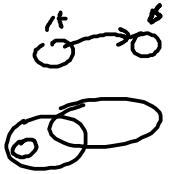
GRAMMAR → . → CODE

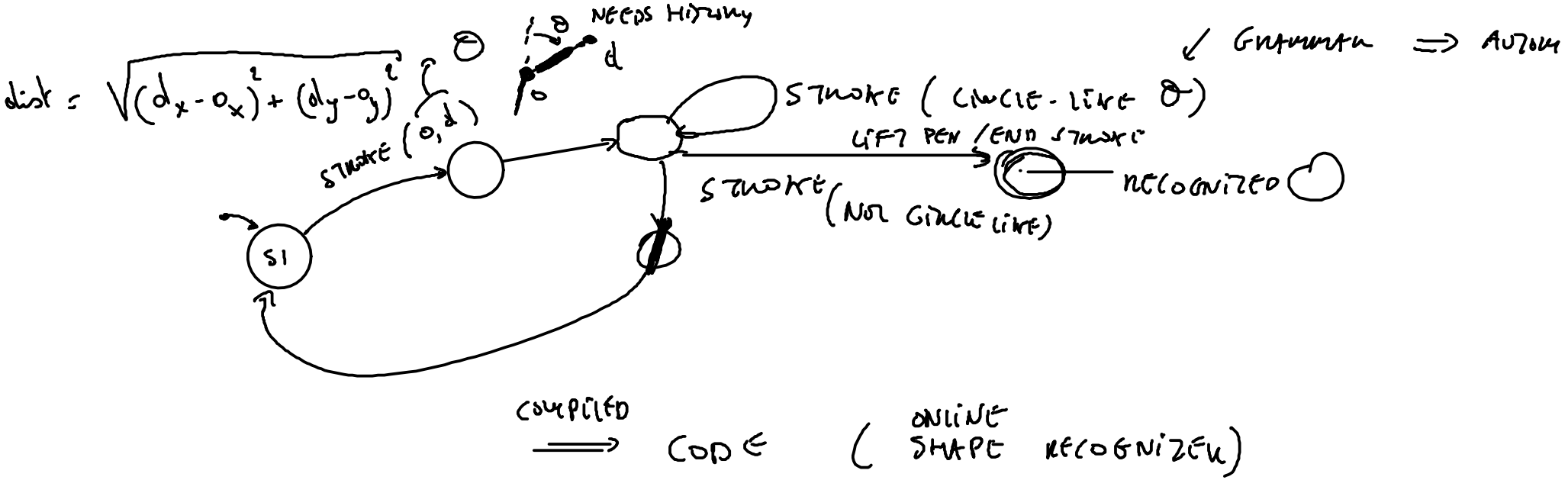
PARSER

(*) PATTERN MODELED AS GRAMMAR (OVER STROKES INSTEAD OF WORDS)

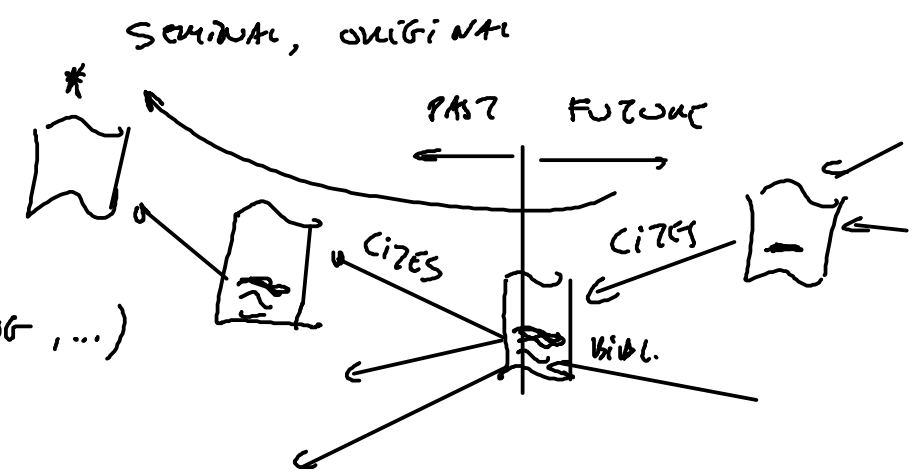
<CIRCLE> := <TURN> | <TURN><CIRCLE>

(COSTAGLIOLA ET AL.)	TEXTUAL LANG ⊆	VISUAL LANG
ALPHABET	"A"	
TOKENS (REGEXP)	"AB" ↑ REPLICATION	. GEOMETRIC . TOPOLOGICAL
LANG. (GRAMMAR)	AB ⊆ CD + E	
	TXT	VISUAL GRAPH




NEEDS HISTORY
GRAMMAR ⇒ AUTOM
dist = $\sqrt{(d_x - o_x)^2 + (d_y - o_y)^2}$
θ
d
o
(o, d)
STROKE (CIRCLE-LIKE θ)
LIFT PEN / END STROKE
STROKE (o, d)
STROKE (NOT CIRCLE LIKE)
RECOGNIZED
S1
COMPILED ⟹ CODE (ONLINE SHAPE RECOGNIZER)

RESEARCH PROJECT

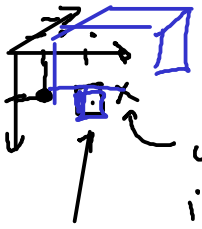


SET RELEVANT HIGH-IMPACT *

CONVERGES

① EXPLORATIVE (WHERE DO WE END?)
- LITERATURE (SURVEY, SNOWBALLING, ...)
- TOOL EVAL ABOUT
- PROTOTYPING

② CLASSIFICATION / DIMENSION (SURVEY PAPER)



- EXIST
- MEANINGFUL

⟹ RESEARCH GOAL

③ WHY? WHAT? HOW?

CHOICE

- INCREMENTALLY
- PROTOTYPES

- TECHNOLOGY:
- Python / Thonny

- PERFORMANCE ③
- FUNCTION ②

START: PAPERS

// 2 x CSA

WORKLOAD: 2 MM 12 SP / 18 SP 30h / SP
5 d/w 6 h/d