

Apprentissage conjoint machine/utilisateur de commandes gestuelles

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<http://www.irisa.fr/intuidoc/>

intu^{doc}!

intuitive
user interaction
for *document*

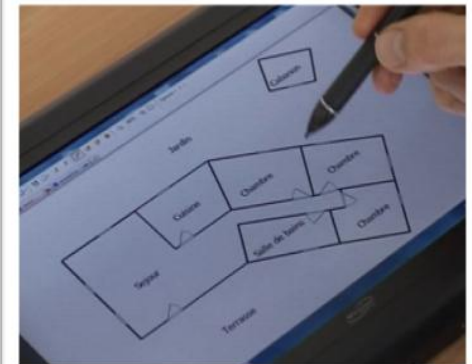
Équipe Intuidoc

Objectifs

Améliorer la communication Homme-Document

Etablir un continuum

Document papier ↔ Document numérique interprété



Composition et analyse interactive de documents

Introduire l'utilisateur dans la boucle



Composition Stylet & Tactile



Contexte applicatif



Composition Stylet & Tactile

Besoin... reconnaissance de gestes

Pour la réalisation de commandes

Pour l'ajout de symboles

Challenge... la personnalisation

Définir / configurer les gestes

Ajouter / supprimer à la volée

Commandes, Symboles et Gestes

Suivre l'évolution de l'utilisateur

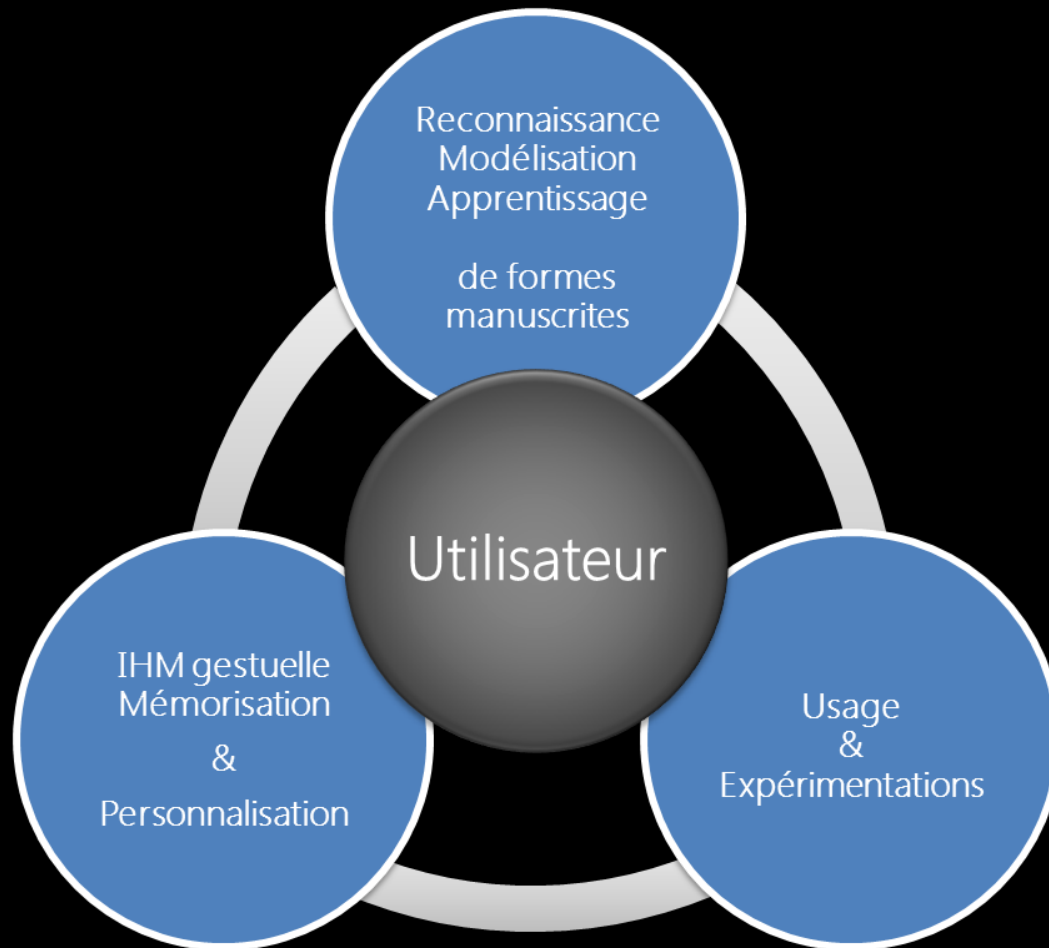
Novice/Expert

Evolution des habitudes de tracé

Aider à la mémorisation des gestes



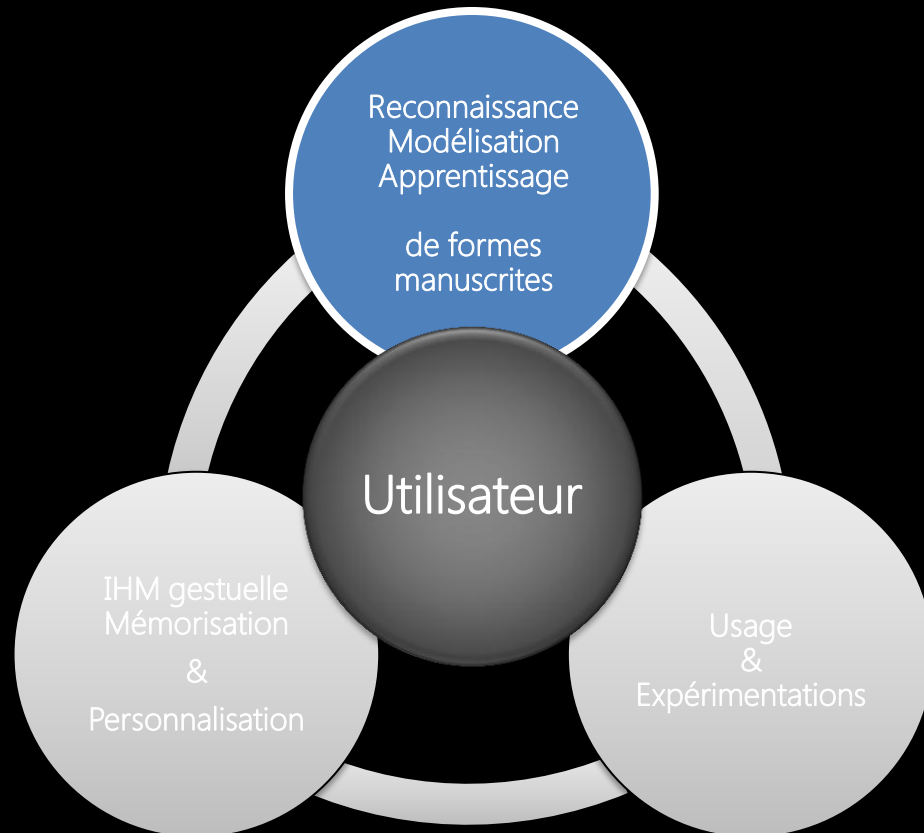
Problématique IHM Stylet & Tactile



Moteur de reconnaissance

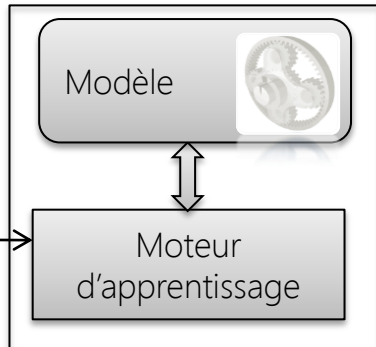
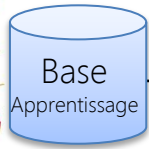


Reconnaissance
Modélisation
Apprentissage

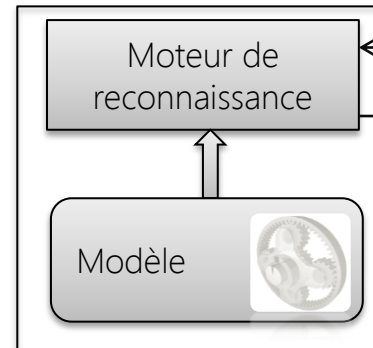


Reconnaissance Modélisation Apprentissage

Apprentissage batch



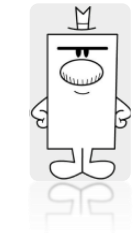
Classifieur Static



$(x, y_?)$

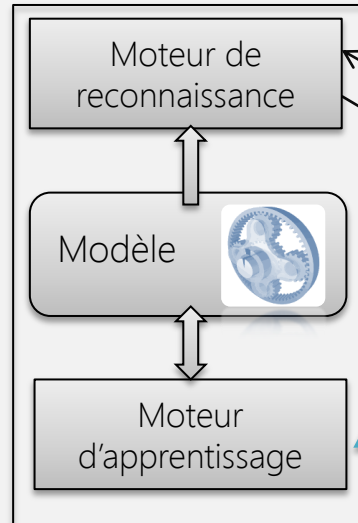


(x, y_i)



Utilisateur

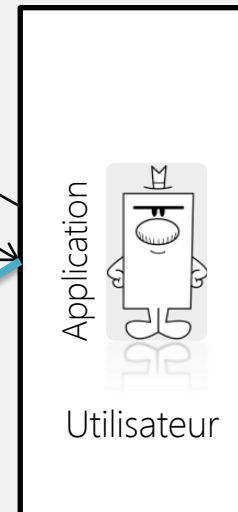
Classifieur Evolutif



$(x, y_?)$

(x, y_i)

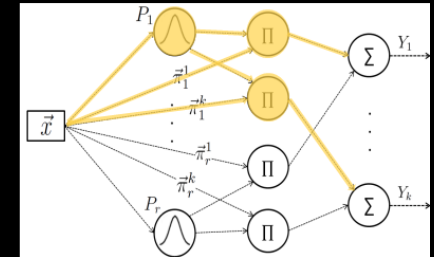
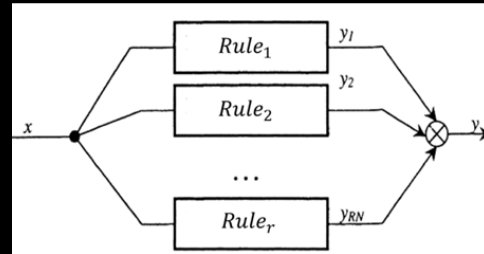
validation/
correction



Apprentissage incrémental

Système d'inférence floue (SIF)

SIF = {règles floues}



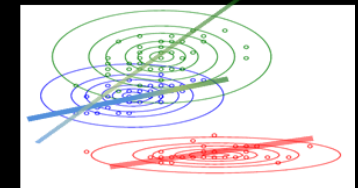
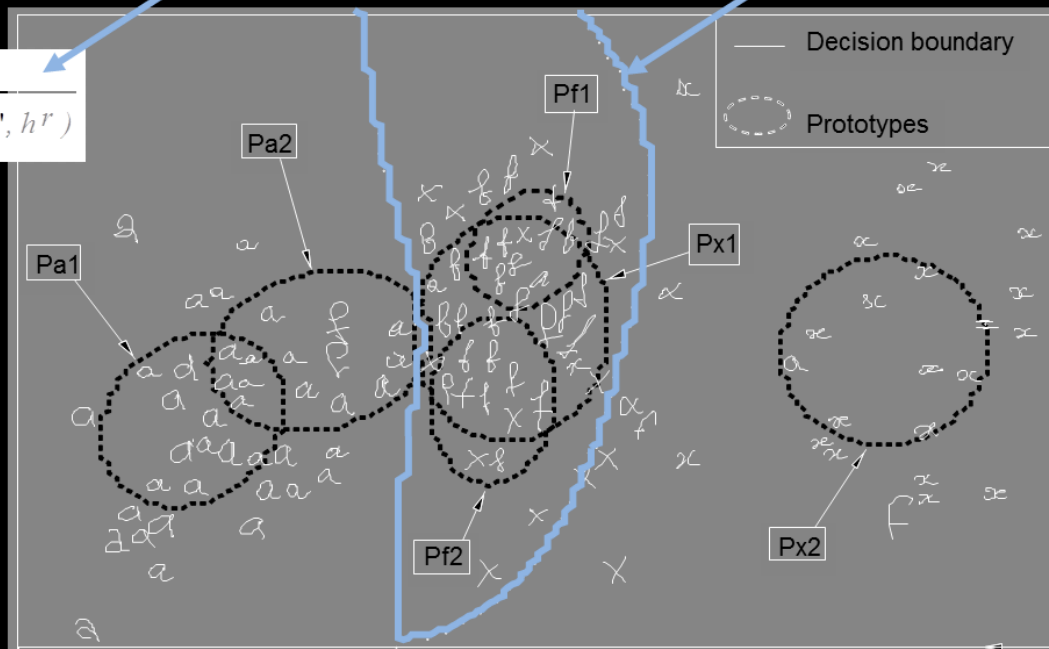
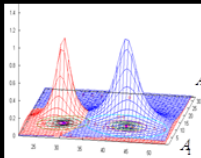
Prémises

Conclusions

Rule_i : IF \vec{x} is close to P_i THEN $y_i^1 = l_i^1(\vec{x}), \dots, y_i^k = l_i^k(\vec{x})$

$$m^r(x') = \frac{1}{1 + d_{Q^r}(x', h^r)}$$

Distance de Mahalanobis

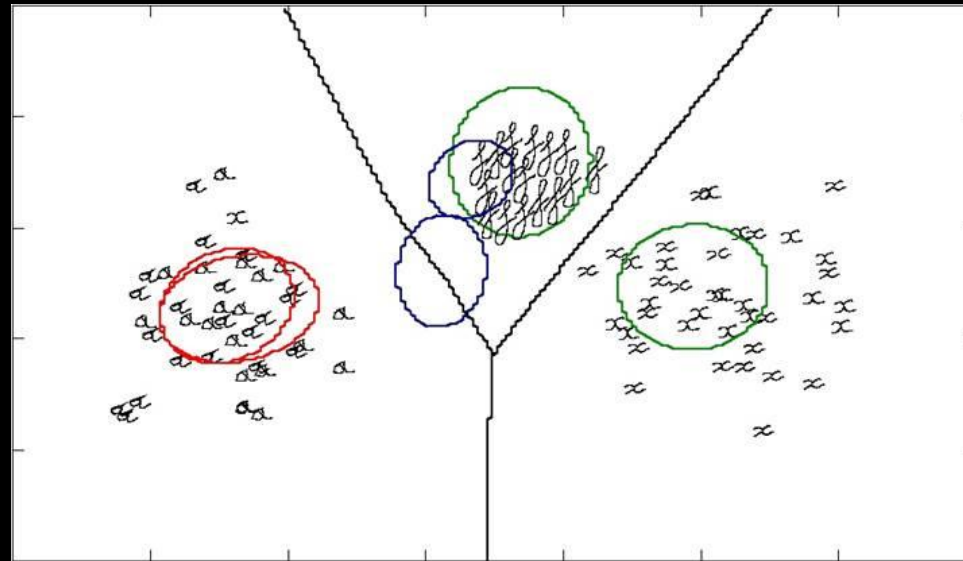
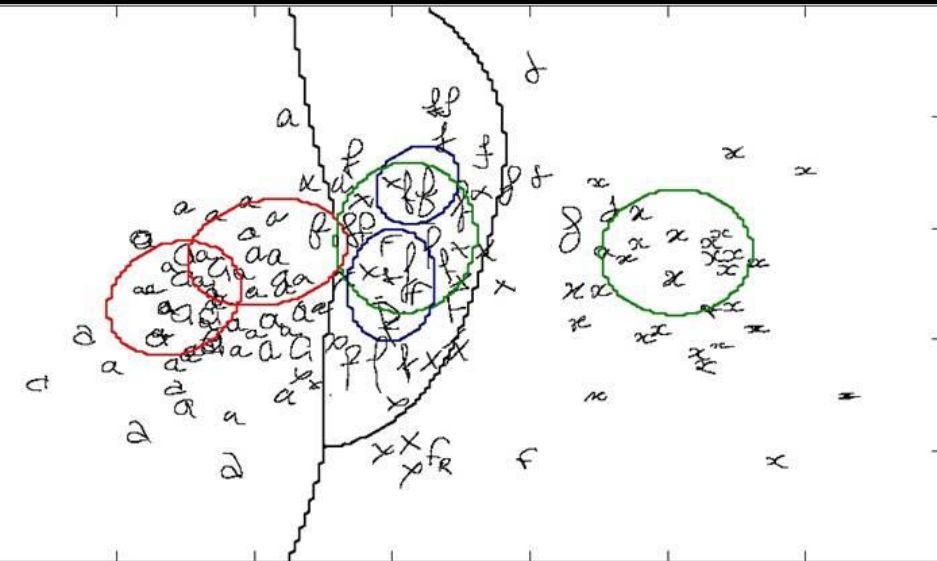


Systeme d'inférence floue (SIF) : Evolution / Adaptation

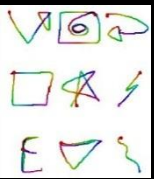
Omni-Scripteur



Mono-Scripteur



Moteur de reconnaissance incrémental : quelques résultats



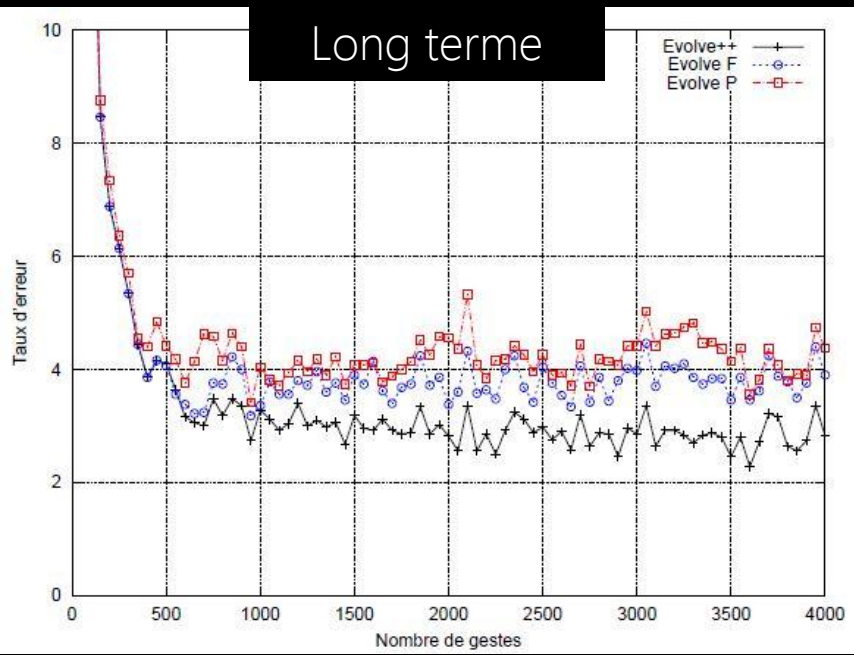
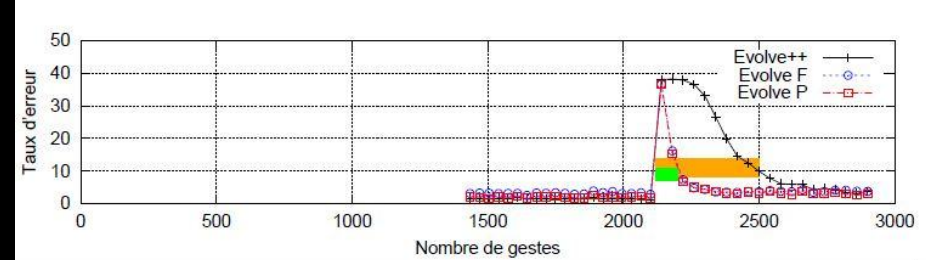
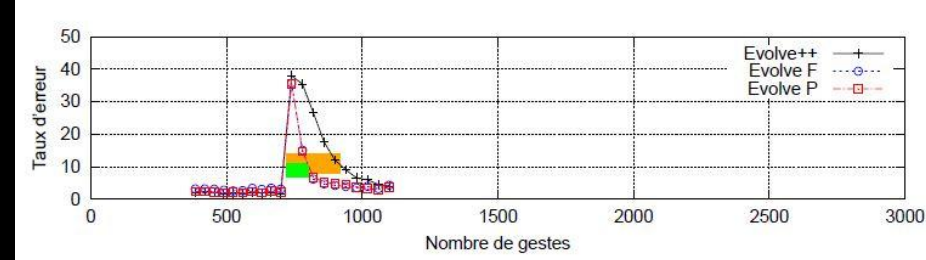
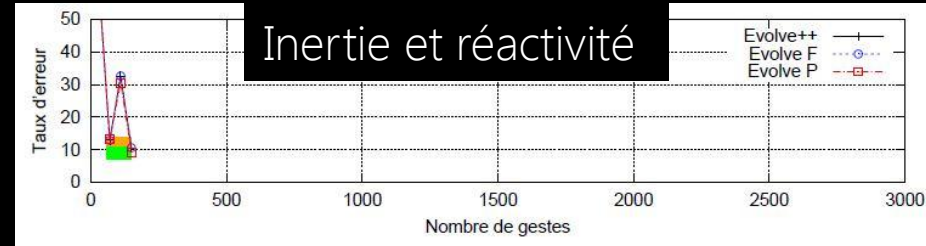
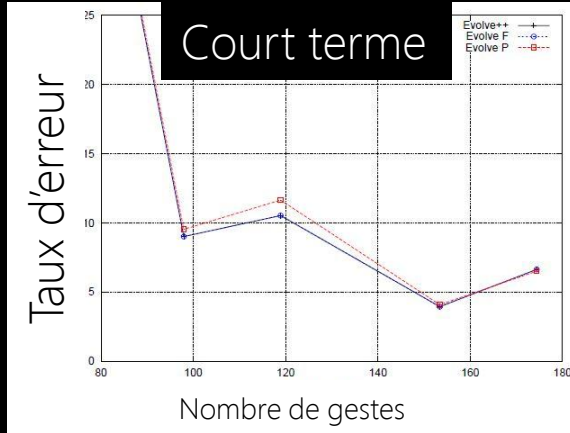
Base ILGDB

(21 classes / 38 scripteurs / 588 classes / 600 gestes)

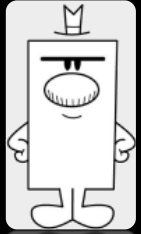


Base IronOff

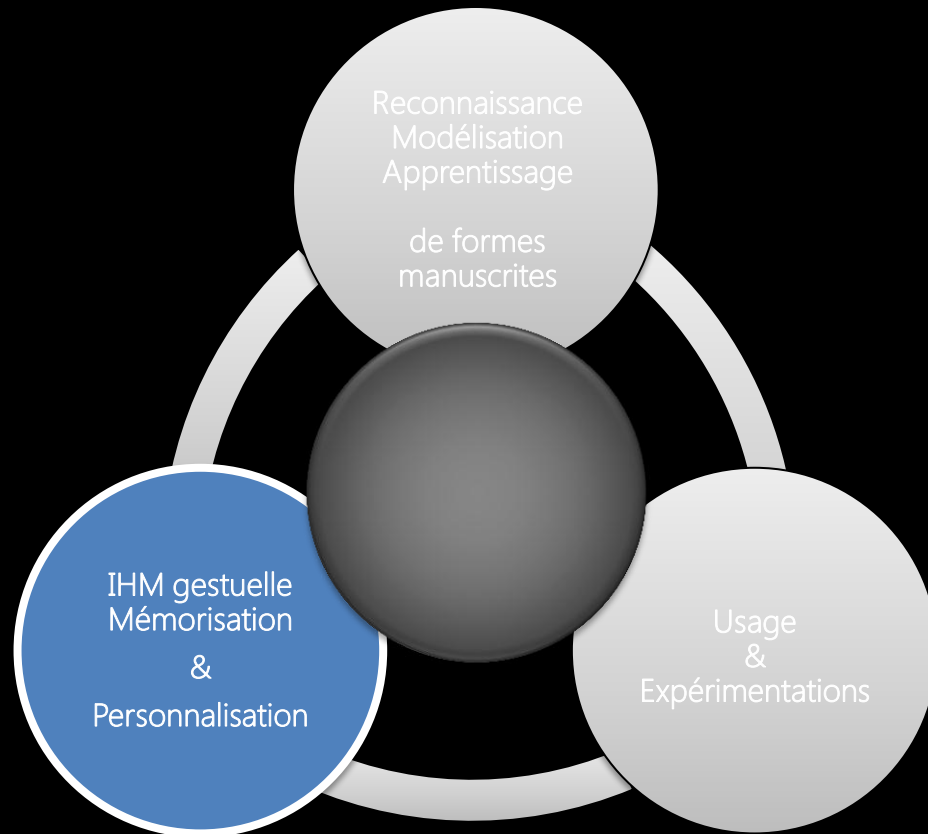
(10 classes / + 4000 exemples)



IHM gestuelle



Personnalisation
Aide à la mémorisation



IHM gestuelles : personnalisables / évolutives

