Technical Report - UML Extraction from PaddleOCR

Objective

Document the full technical process used to reverse-engineer PaddleOCR and extract UML diagrams (class, architecture, and dependency graphs), aiming to facilitate study and comprehension of the framework.

Tools and Dependencies Used

1. Operating System: Windows 10 64-bit
2. Cloned Repository: https://github.com/PaddlePaddle/PaddleOCR
3. Documentation Tools:
   - Doxygen 1.9.8: For C++ code analysis and automatic documentation generation.
   - Graphviz: To render class and call diagrams. Path: C:/Program Files/Graphviz/bin
   - Visual Studio Code: For editing the Doxygen configuration file (Doxyfile).
   - MiKTeX (optional): Initially used for PDF export via LaTeX but later replaced by HTML due to efficiency.

Doxygen Configuration (Key Parameters)

```
PROJECT_NAME           = PaddleOCR
INPUT                  = ./paddleocr_root
RECURSIVE              = YES
FILE_PATTERNS          = *.cpp *.h
EXTRACT_ALL            = YES
HAVE_DOT               = YES
CALL_GRAPH             = YES
CALLER_GRAPH           = YES
CLASS_DIAGRAMS         = YES
DOT_PATH               = "C:/Program Files/Graphviz/bin"
DOT_IMAGE_FORMAT       = png
GENERATE_HTML          = YES
GENERATE_LATEX         = NO
```

Generated Output

1. HTML Documentation Folder:
   - Contains: class diagrams, collaboration diagrams, hierarchy/dependency trees.

2. PDF Documents:
   - OCR_IA_Bibliotecas_Documentacao.pdf: UML diagrams of core components.
   - Relatorio_Ambiente_OCR_IA.pdf: Summary of environment, tools, and dependencies.

GitHub Repository

Public link: https://github.com/lulodbeast656/paddleocr-reverse-uml
License: MIT

Structure:
README.md
LICENSE

paddleocr_reverse_UML_doc/
  OCR_IA_Bibliotecas_Documentacao.pdf
  Relatorio_Ambiente_OCR_IA.pdf
  [HTML Documentation Files]

Final Notes

Due to the modularity and deep learning architecture of PaddleOCR, understanding it without tools is difficult.
UML reverse engineering provides structured access to its internal components and helps developers, students, and researchers.
This is the first of several planned repositories covering other OCR frameworks such as Tesseract and EasyOCR.