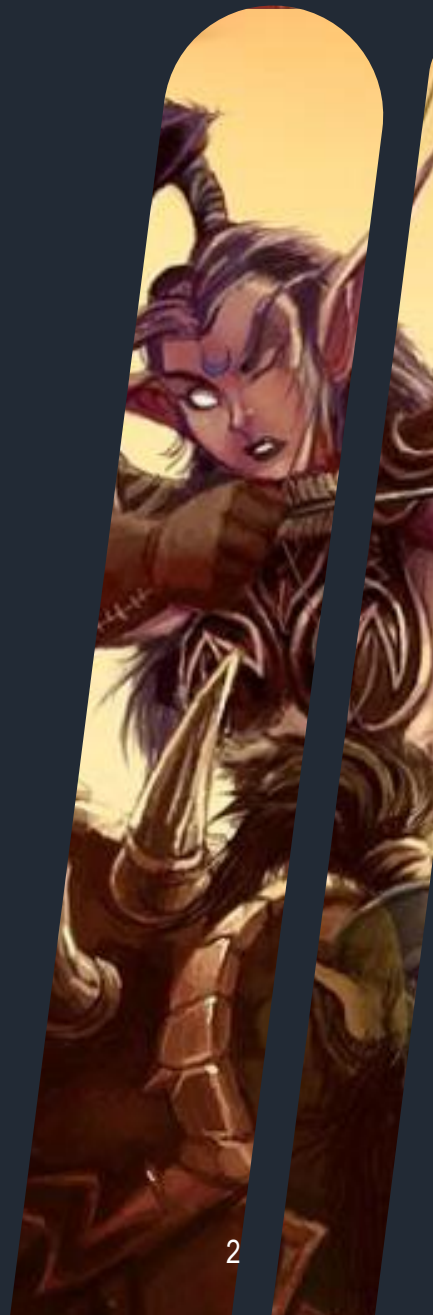
Reverse-Engineering

Extracting Game Assets from Warcraft 1 (MacOS)

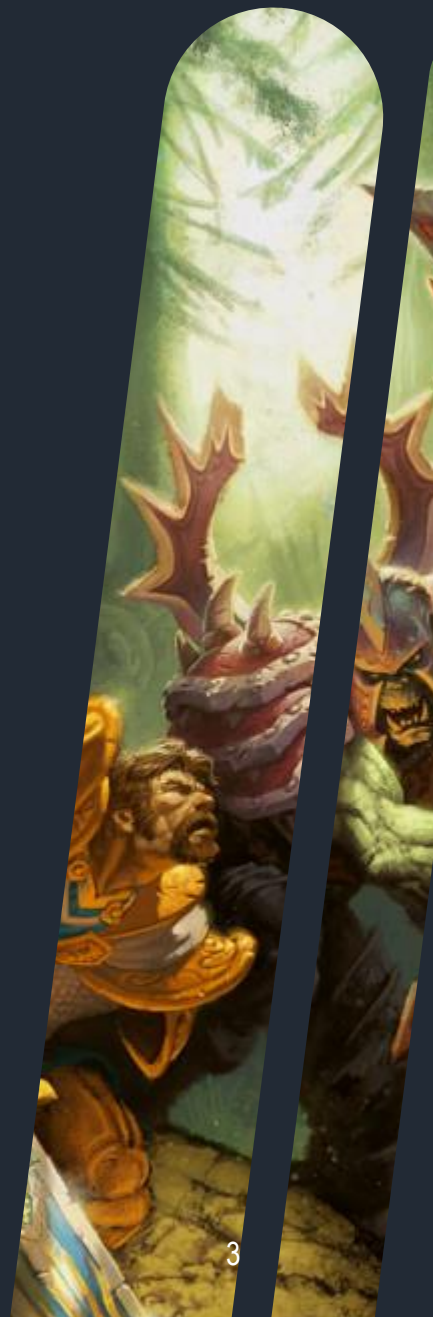
Overview

- Where we left off
- What we have done since then
- What we would want to try if we had the time



Where we left off

- rewritten some extraction tools in Python
- extracted text & audio
- developed some ideas for helpful tools



What we had as a starting point

BLIZZARD ARCHIVE

Warcraft: Orcs & Humans

Files/Versions Screenshots

Version History

Ver.	Date	Comment/Download	List File	Archive Version
Warcraft 1 PC				
	Oct 04, 1994	Warcraft Demo 1	Demo	Demo
	Oct 06, 1994	Warcraft Demo 2	Demo	Demo
	Oct 06, 1994	Warcraft Interplay Demo	Demo	Demo
1.12	Nov 03, 1994	Retail Floppy	Retail	Retail
1.12	Nov 03, 1994	Retail CD-ROM	Retail	Retail
1.12	Nov 23, 1994	Warcraft Demo 3	Retail	Demo
1.13				
1.14				
1.15	Dec 27?, 1994	Warcraft Patch 1.15		
1.16	Jan 25, 1995	Warcraft Patch 1.16		
1.20	Mar 06, 1995	Warcraft Patch 1.20		
1.21	Mar 15, 1995	Creative Labs Demo CD 1.21	-TODO-	-TODO-

BIN-FILE

Extras

How Warcraft 1 files work (PDF)

Warcraft 1 Insider's Guide (1995-08-27)

All DATA.WAR files (except MPlayer and TEN)

Wargus / war1gus

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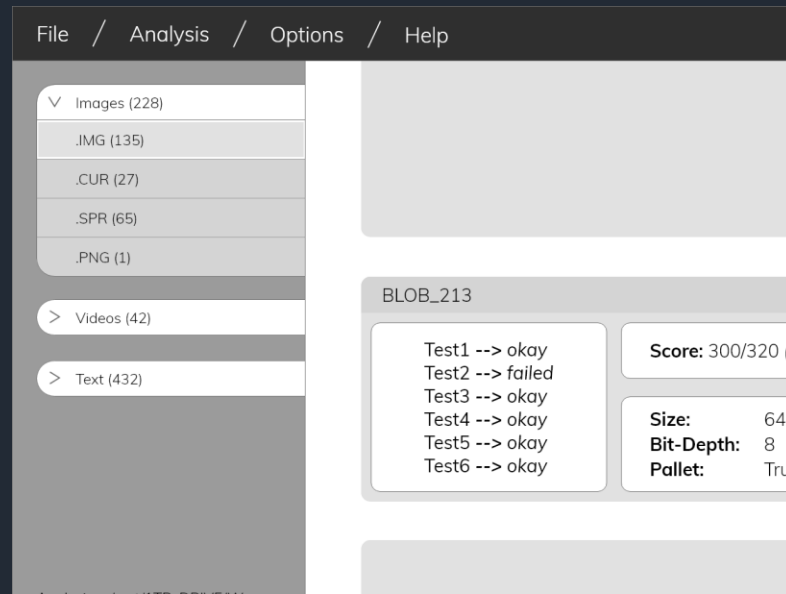
What we wanted to do since we left off

- develop the presented tools (for better ease-of-use)
  - evaluate developed indicators (e.g. For JPEGs)
- extract assets from the Binary (as it is the original task)



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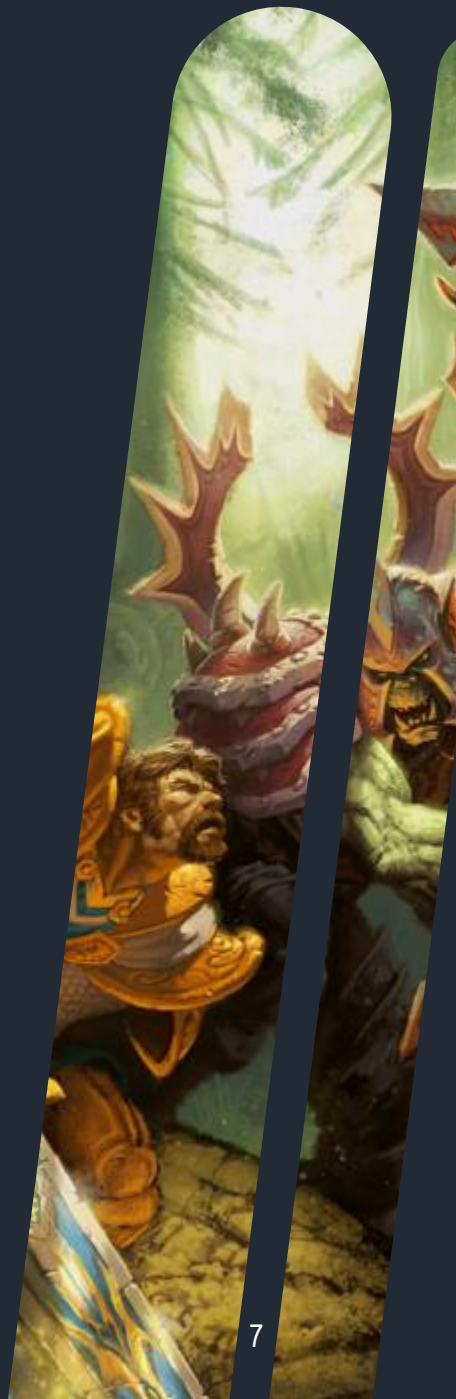
What we actually did

- extracted sprites and image assets
- extracted image paletts
- endianess is now taken into account
- developed a frontend for our tool(s)

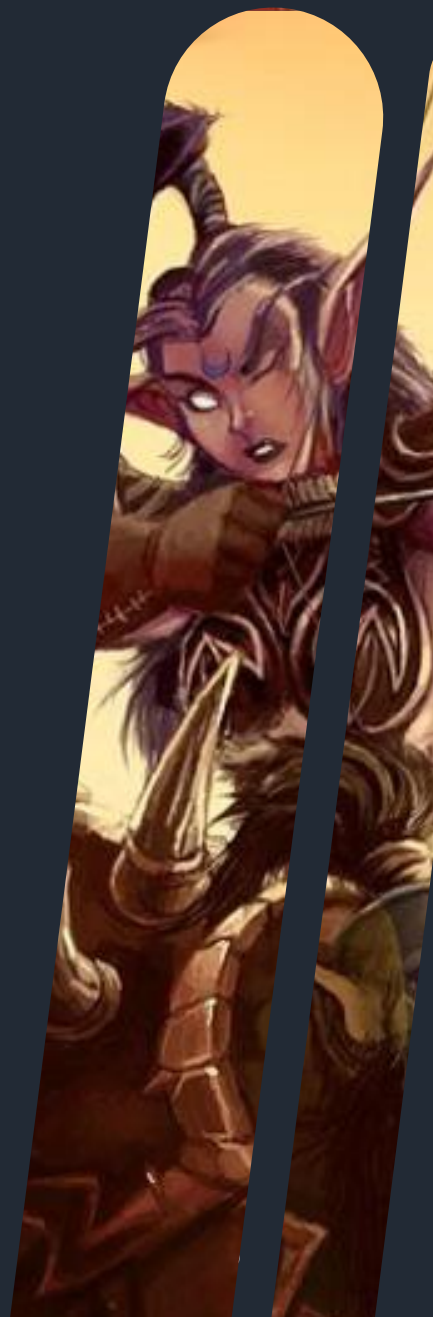
What we could not do

- developed more & better metrics
  - time constraints
- idea: let the computer discover the metric
  - neural networks as qualifier
  - LSTM – networks for analyzing continous data
- image metrics
  - high repetition data
  - reason about size-bytes



Demo Time

-- frontend --



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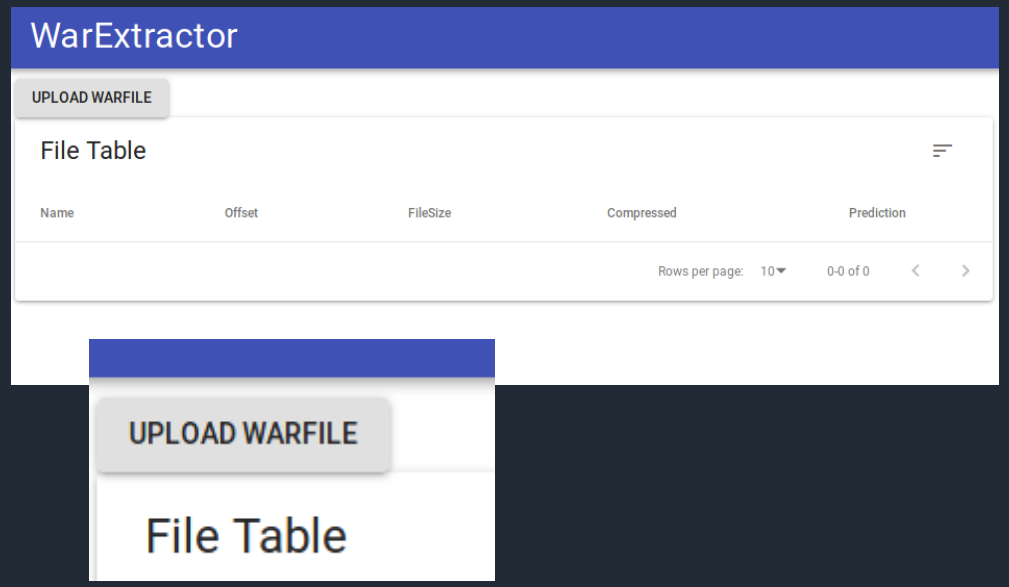
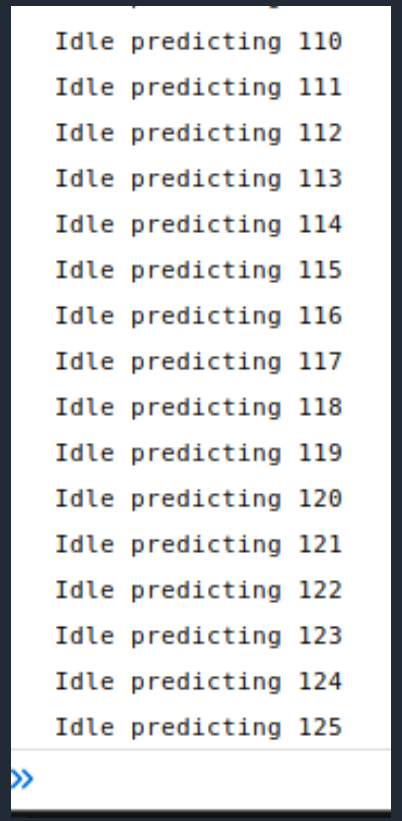
Demo Time

-- backup --





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2	4672	0	⊗
3	4672	0	⊗
4	4672	0	⊗
5	4672	0	⊗
6	4672	325381	⊗
7	330053	510694	⊗
8	840747	393723	⊗
9	1234470	467406	⊗

File Table | 583 files found

Name	Offset	FileSize	Compressed	Prediction
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1	4672	0	⊗	GUESS: PLACEHOLDER
2	4672	0	⊗	GUESS: PLACEHOLDER
3	4672	0	⊗	GUESS: PLACEHOLDER
4	4672	0	⊗	GUESS: PLACEHOLDER
5	4672	0	⊗	GUESS: PLACEHOLDER
6	4672	325381	⊗	GUESS: AUDIO
7	330053	510694	⊗	GUESS: AUDIO
8	840747	393723	⊗	GUESS: AUDIO
9	1234470	467406	⊗	GUESS: AUDIO

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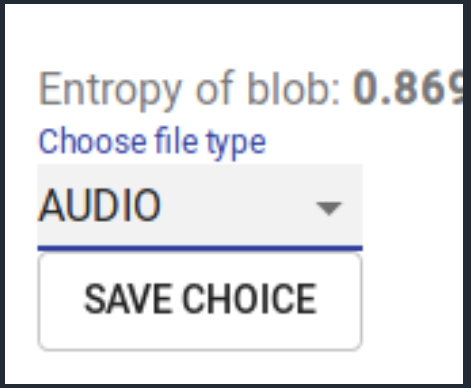
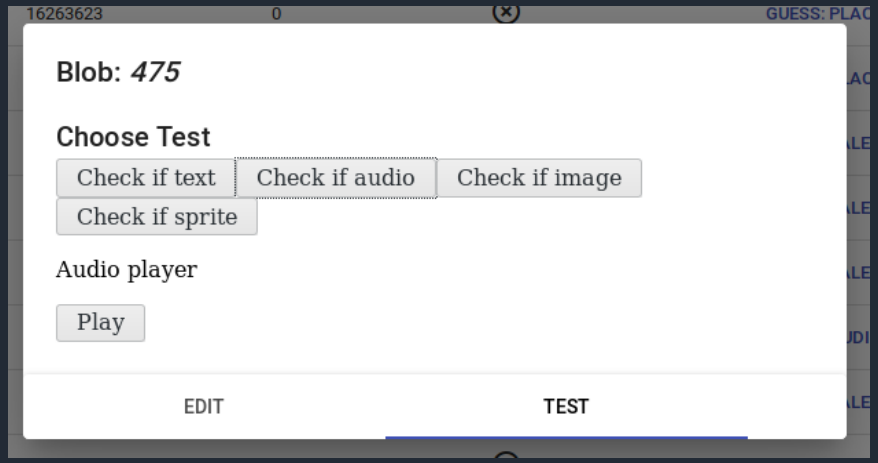
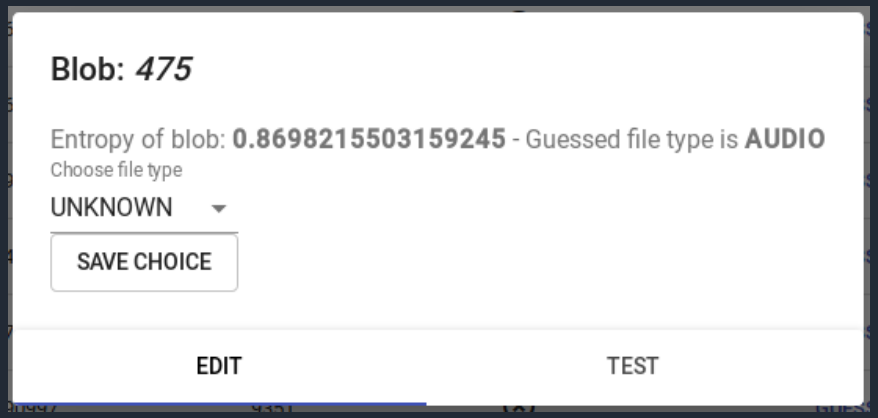
16373407	17590	⊗	GUESS: AUDIO







If we had more time we would

- try to find more & better metrics
  - implement the neural network
- better UX for the tool
  - image alignment tool
  - full circle: hex editor
- make it more universal
- make it more robust

Thanks!