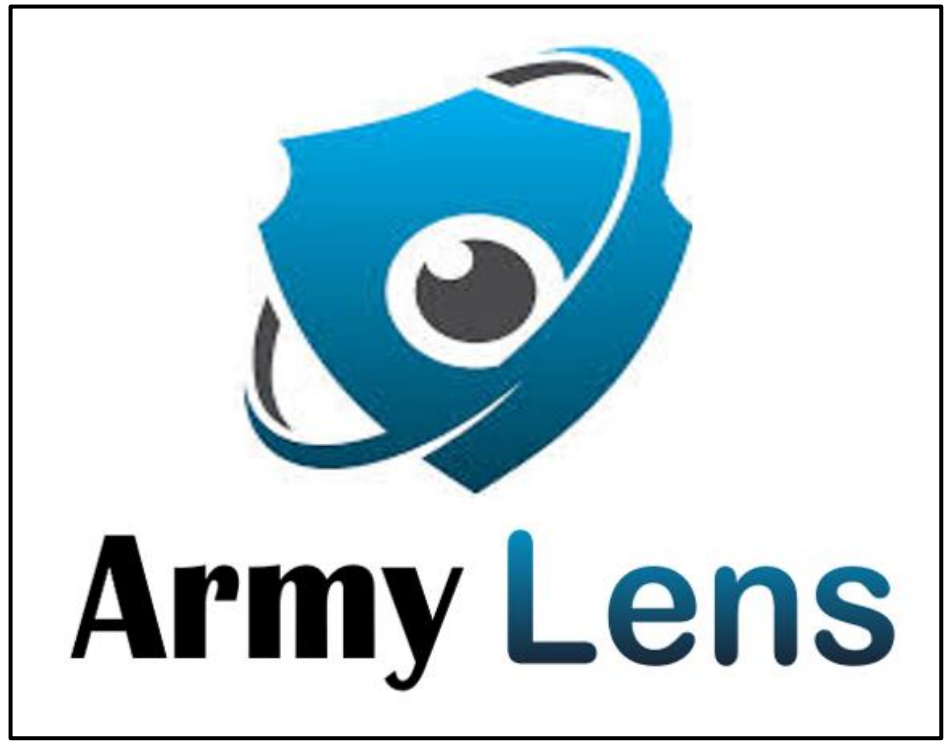
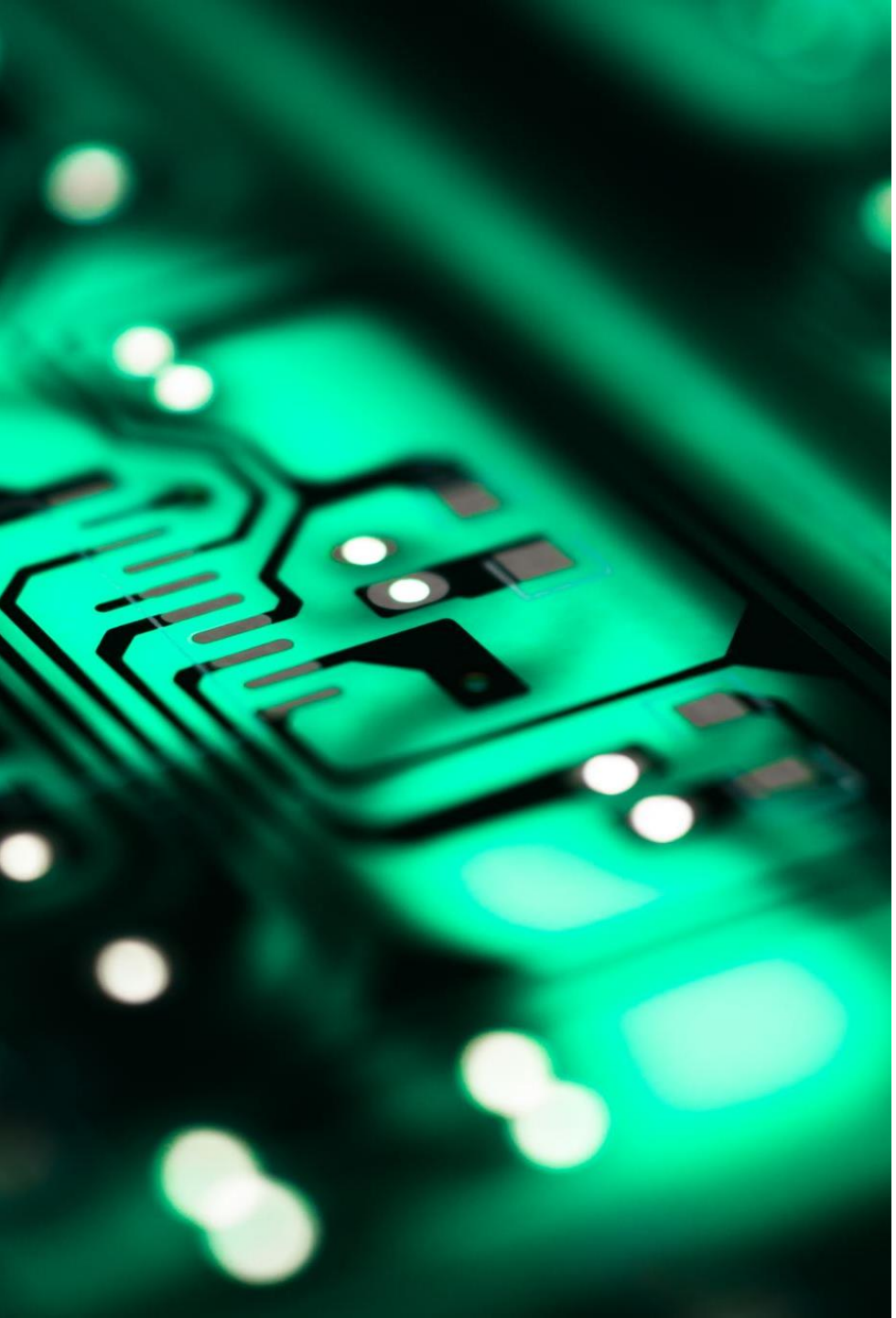


AI기술을 활용한 직관적인 안보 위협요소 식별 어플

28사단 전차대대 2중대

일병 박준수

일병 유건우



목차

Army Lens

AI 기술을 활용한
통합 안보 위협요소 식별 어플

지뢰 위험 국가 대한민국

완전 제거가 불가능한 지뢰

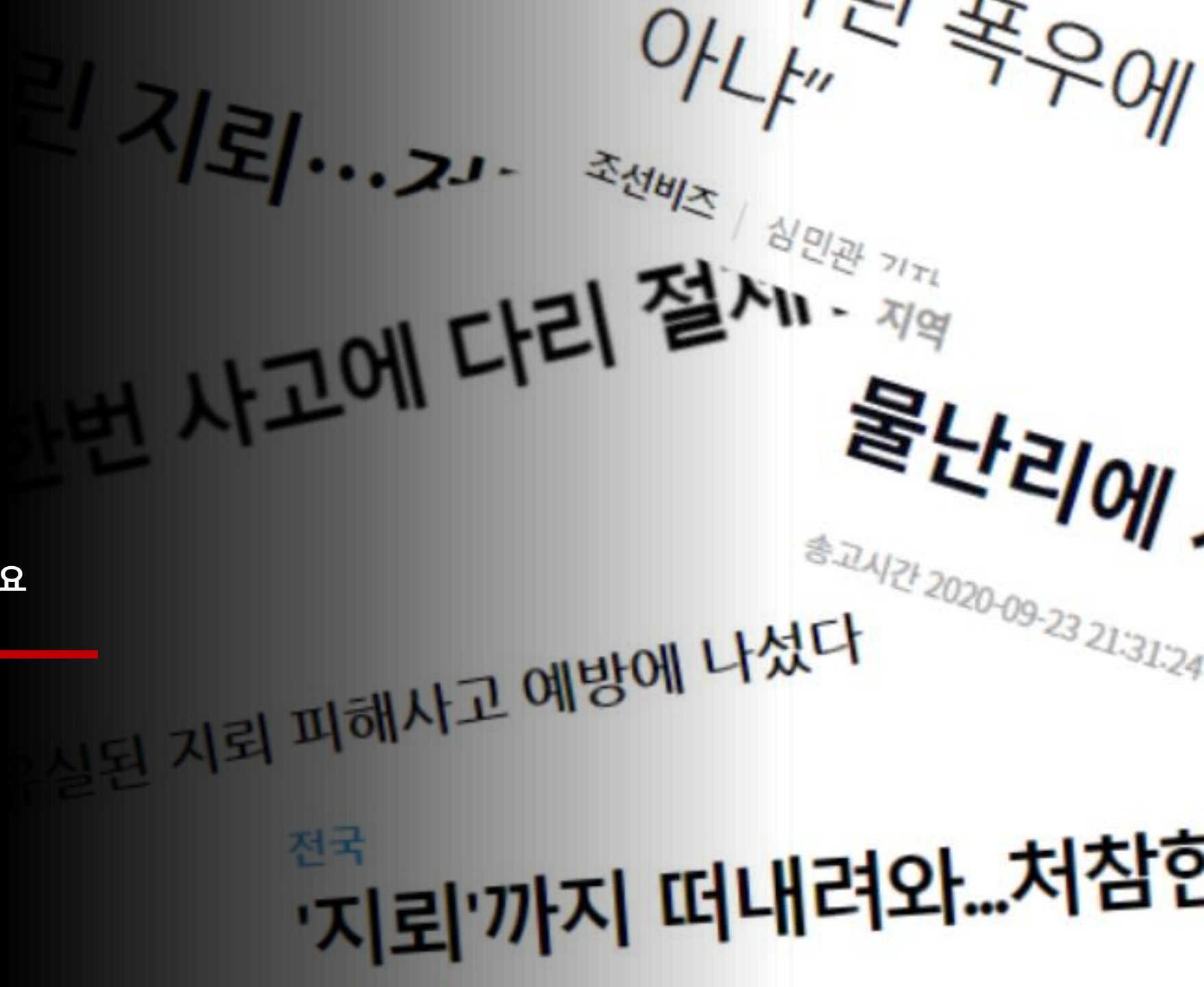
- 지뢰의 높은 불발율과 낮은 제거율
- 토사를 따른 지뢰의 이동

지뢰를 빠르게 식별하고 신고할 수 있는 시스템이 필요

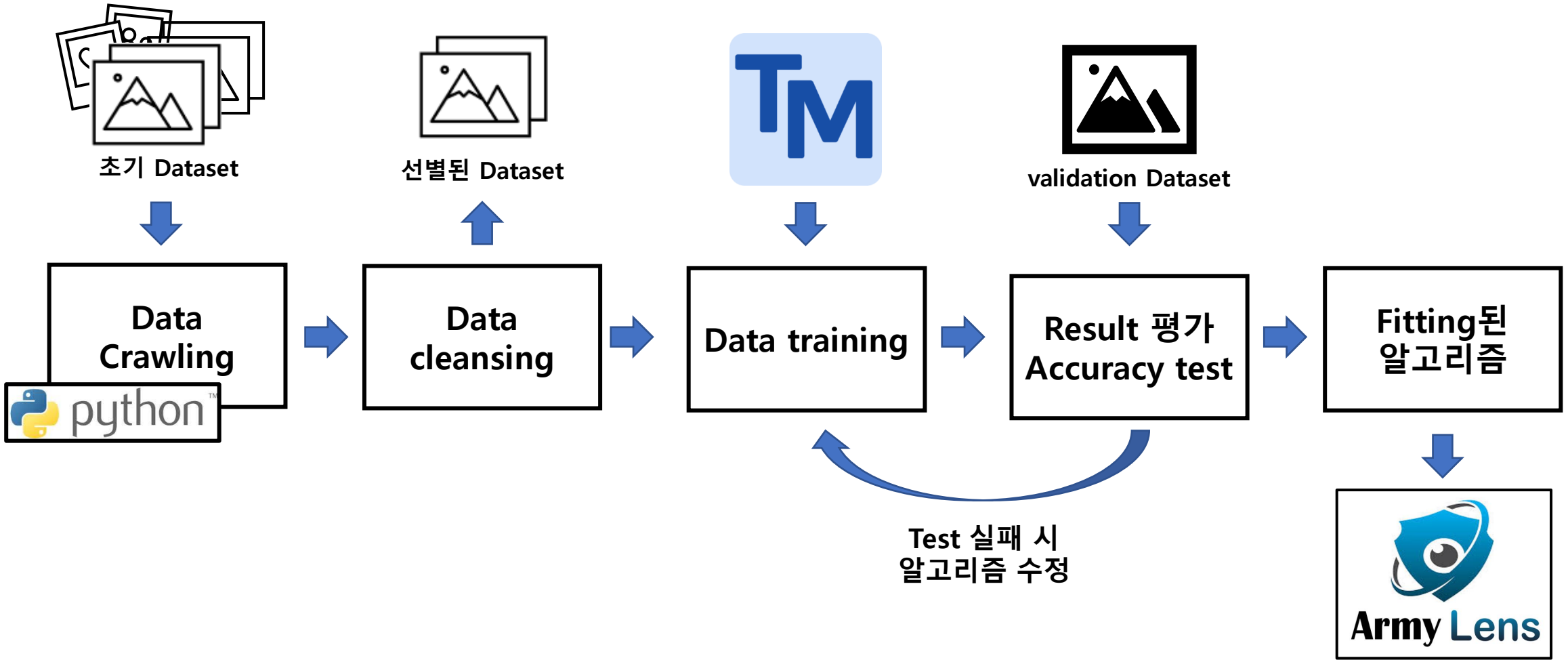
'지뢰 매설 밀도 세계1위' 한반도 DMZ
완전 제거 까지 489년 걸릴 것으로 추측..

강원 철원, 대전차 지뢰 폭발로 운전자 사망..

2020년 7월, 한강 김포대교 부근 폭발
전문가 "지뢰 사고로 추정"..



AI Learning Pipeline



1. Data Crawling

google.py × _main_.py

google.py

```
1  from google_images_download import google_images_download
2
3  response = google_images_download.googleimagesdownload()
4
5  arguments = {"keywords":"MM-1 Minimore,XM1100 IMS,Hafthohlladung,PFM-1,Wooden-box Mines,M14 mine,M15 mine,M16 mine,M
6  paths = response.download(arguments)
7  print(paths)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 2: Python

```
Image URL: https://static.wikia.nocookie.net/armedassault/images/6/6e/Arma1-landmines-00.png/revision/latest/scale-to-width-down/340?cb

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Completed Image ====> 4.t-1.png
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Completed Image ====> 5.mini_extensible_bellow_2.png
Image URL: http://opensoftrobotics.sakura.ne.jp/robotrecipe/wp-content/uploads/2018/04/Screen-Shot-2018-04-20-at-1.48.29-AM-300x164.png
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Image URL: https://upload.wikimedia.org/wikipedia/commons/thumb/0/09/Macleod_Claymore_patent.png/220px-Macleod_Claymore_patent.png
Completed Image ====> 7.220px-macleod_claymore_patent.png
Image URL: https://upload.wikimedia.org/wikipedia/commons/thumb/8/8e/M18_claymore_US_army_drawing.svg/220px-M18_claymore_US_army_drawing
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Image URL: https://static.wikia.nocookie.net/armedassault/images/7/7e/Arma2-icon-mineeast.png/revision/latest/scale-to-width-down/340?c
9
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c-body-motion-detection-night-vision-home-2.png
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ome-2.png
Image URL: https://sites.google.com/site/stingraysworld0explosives/_/rsrc/1264541235882/config/app/images/customLogo/customLogo.gif?rev
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Image URL: https://files.cults3d.com/uploads/blueprint/previews/000/112/433/preview/c27dda9d-9f45-45d5-a900-a845accbf98f.png
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Image URL: https://static.wikia.nocookie.net/armedassault/images/0/02/Arma3-icon-claymore.png/revision/latest/scale-to-width-down/340?c
6
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Image URL: https://flickerreport.com/wp-content/uploads/2020/10/Screenshot-2020-10-13-at-20.55.25-1024x573.png
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Image URL: https://i.imgur.com/HRxFpsH.png
```
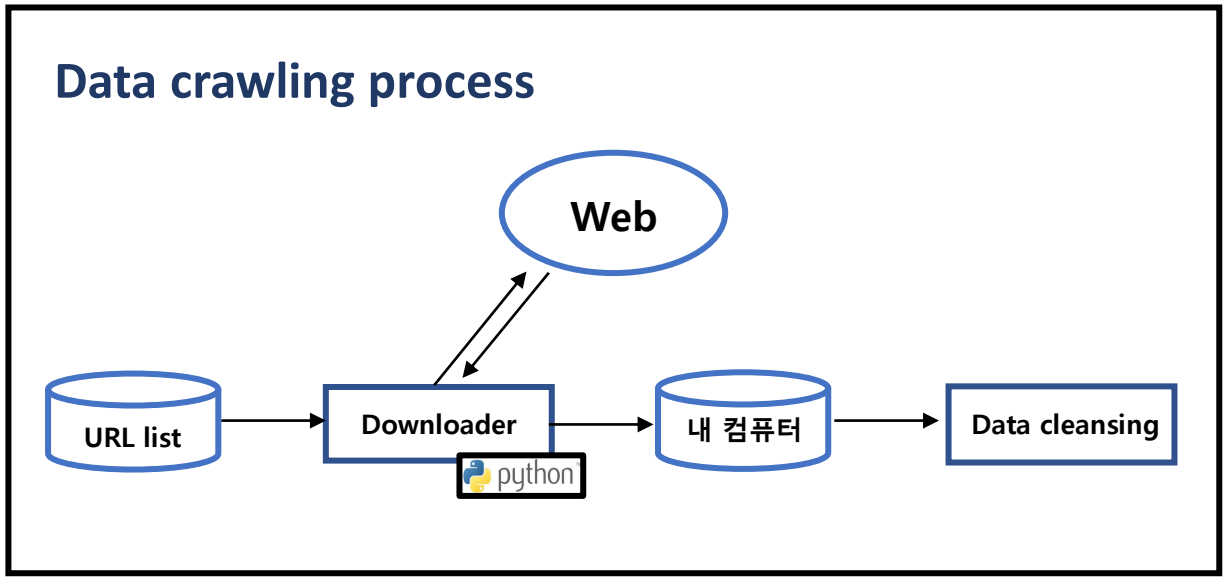
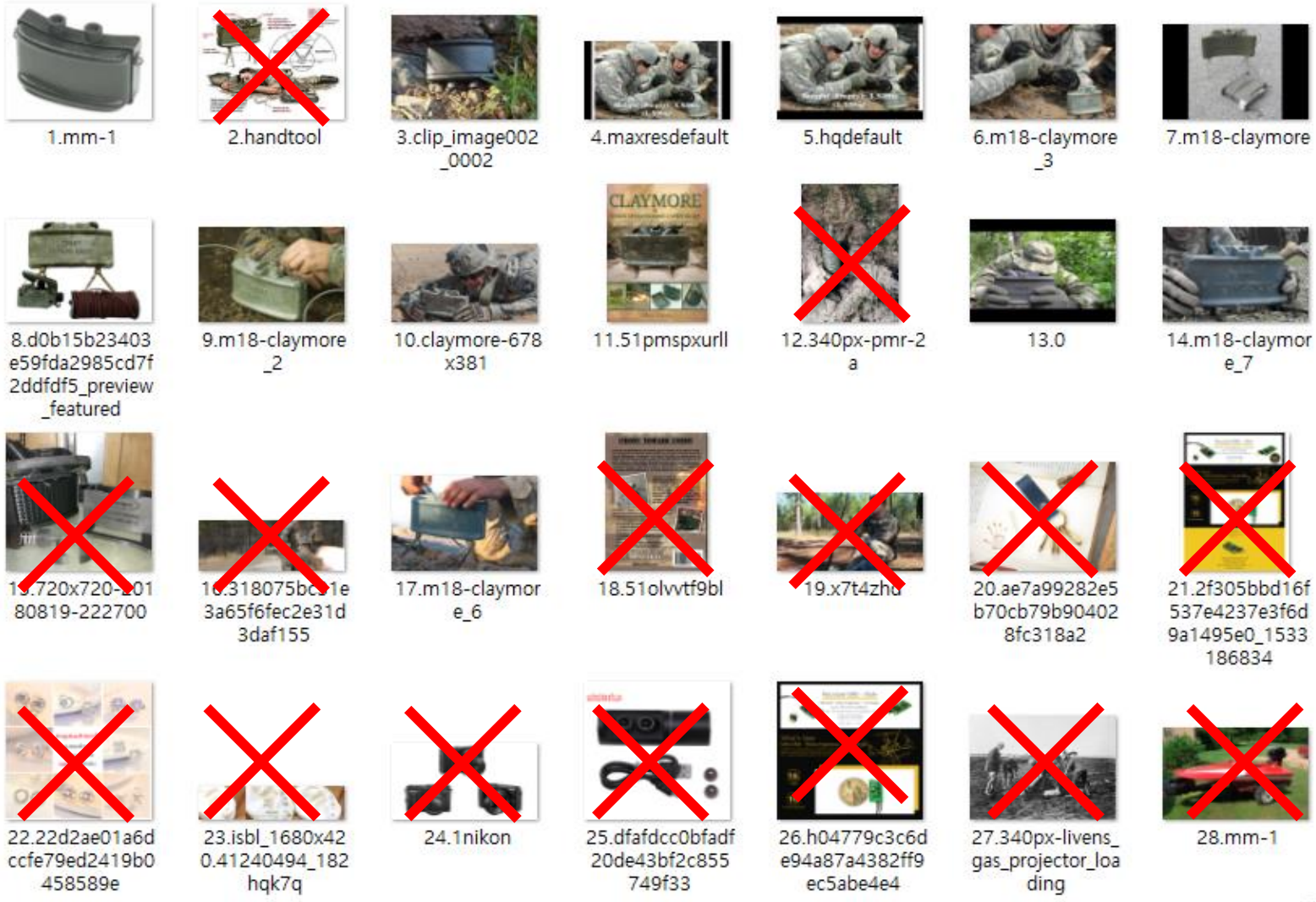
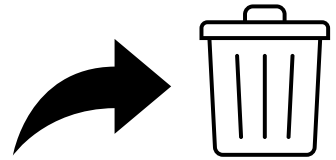

Python 코드를 이용한 지뢰 관련 이미지 수집



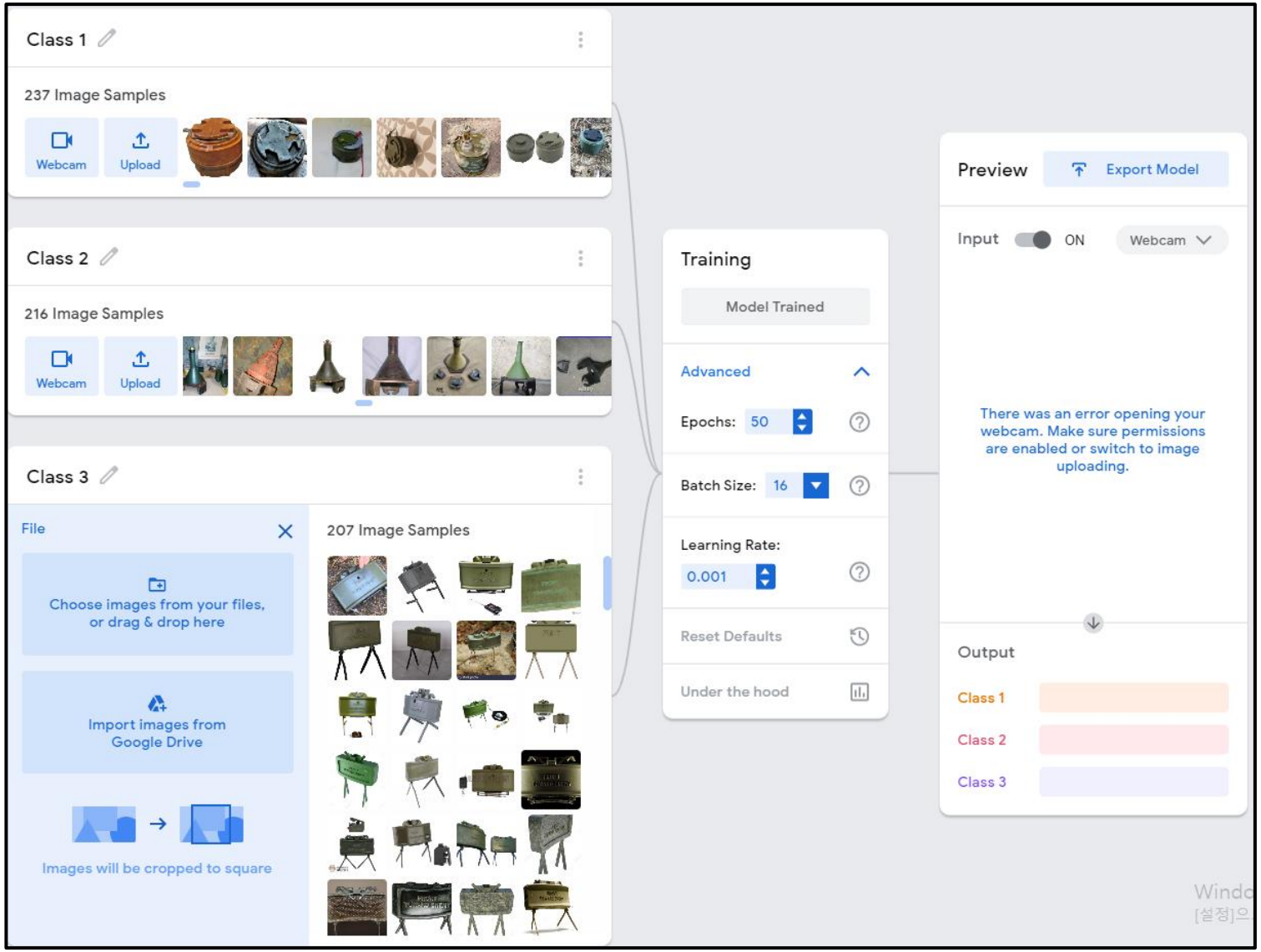
2. Data Cleansing





Download를 통해 얻은 초기 data set에서 Garbage data 제거 및 curated data 선별

3. Data training + Accuracy test



선별된 data로 지뢰 종류별 class를 만들어 training을 진행

dataset 100개

Accuracy test

Validation set

Accuracy rate 70~80%

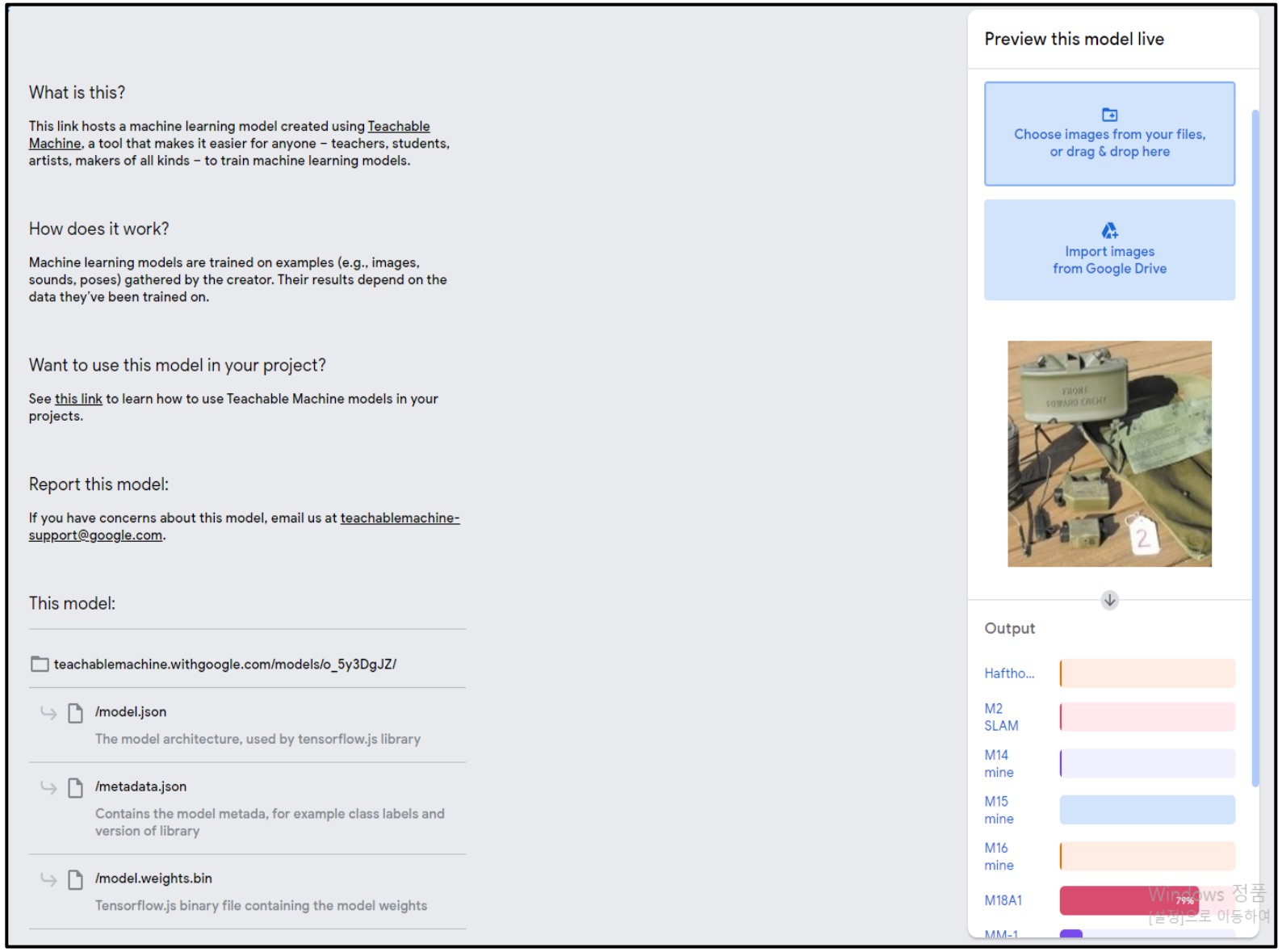
dataset 200개

Accuracy test

Validation set

Accuracy rate 90~95%

4. Fitting 된 알고리즘의 적용



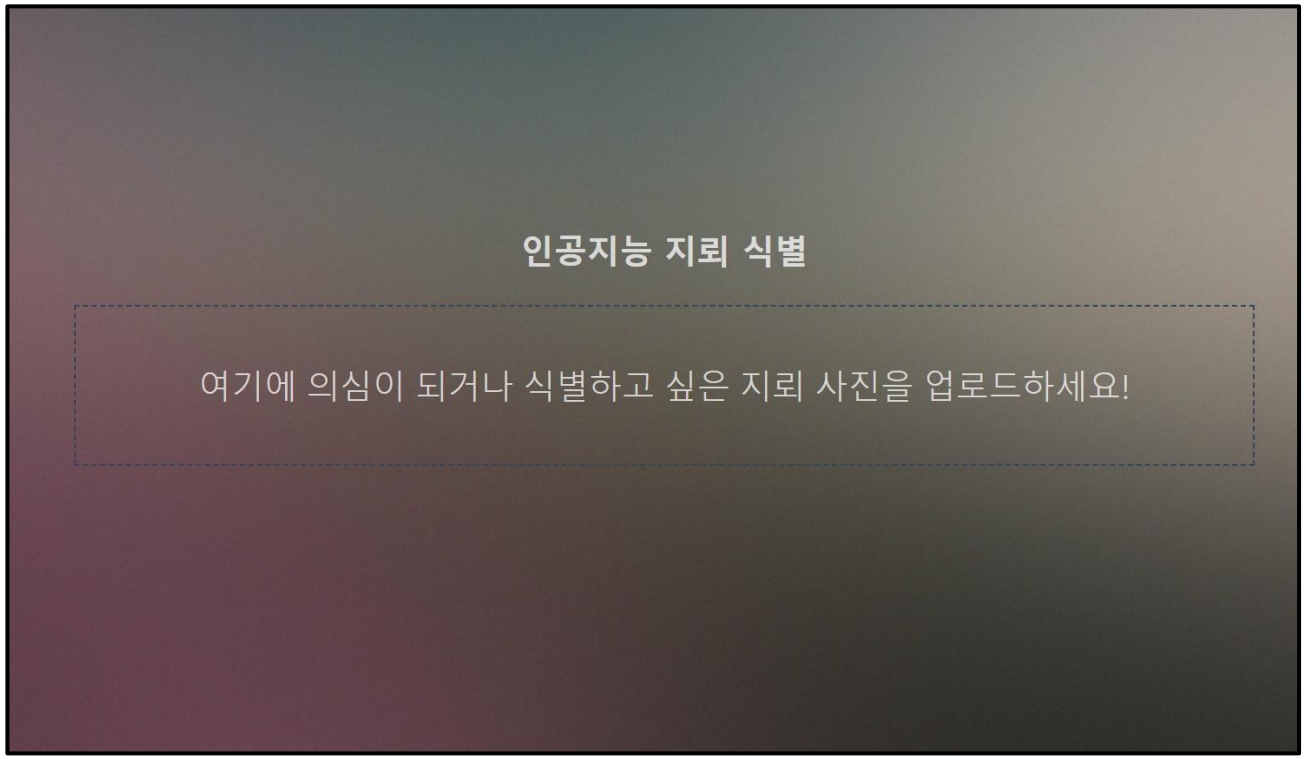
최종적으로 fitting된 알고리즘을 추출하여 Webpage에 적용

Website & APP 제작

다양한 opensource를 활용하여 제작

1. 지뢰 식별 PAGE

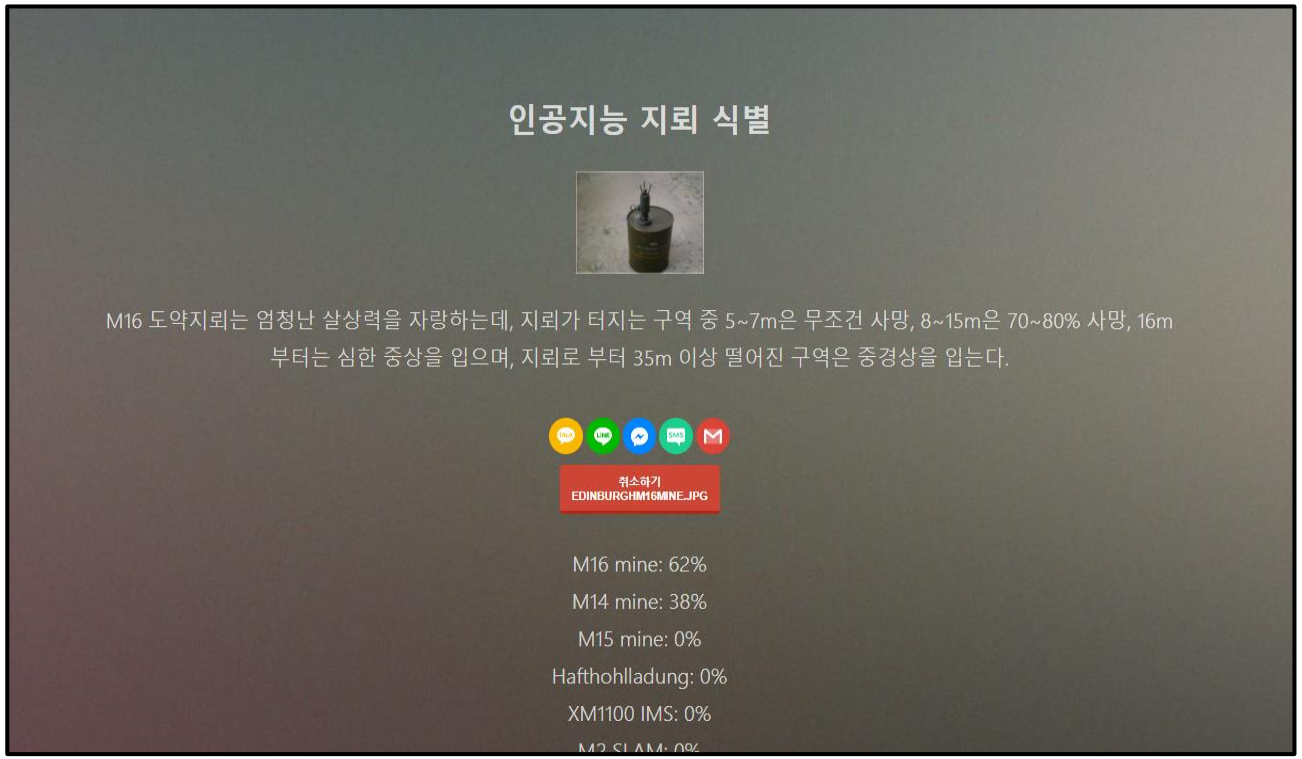
신속하고 간단한 지뢰식별 프로세스



Army Lens

1. 지뢰 식별 PAGE

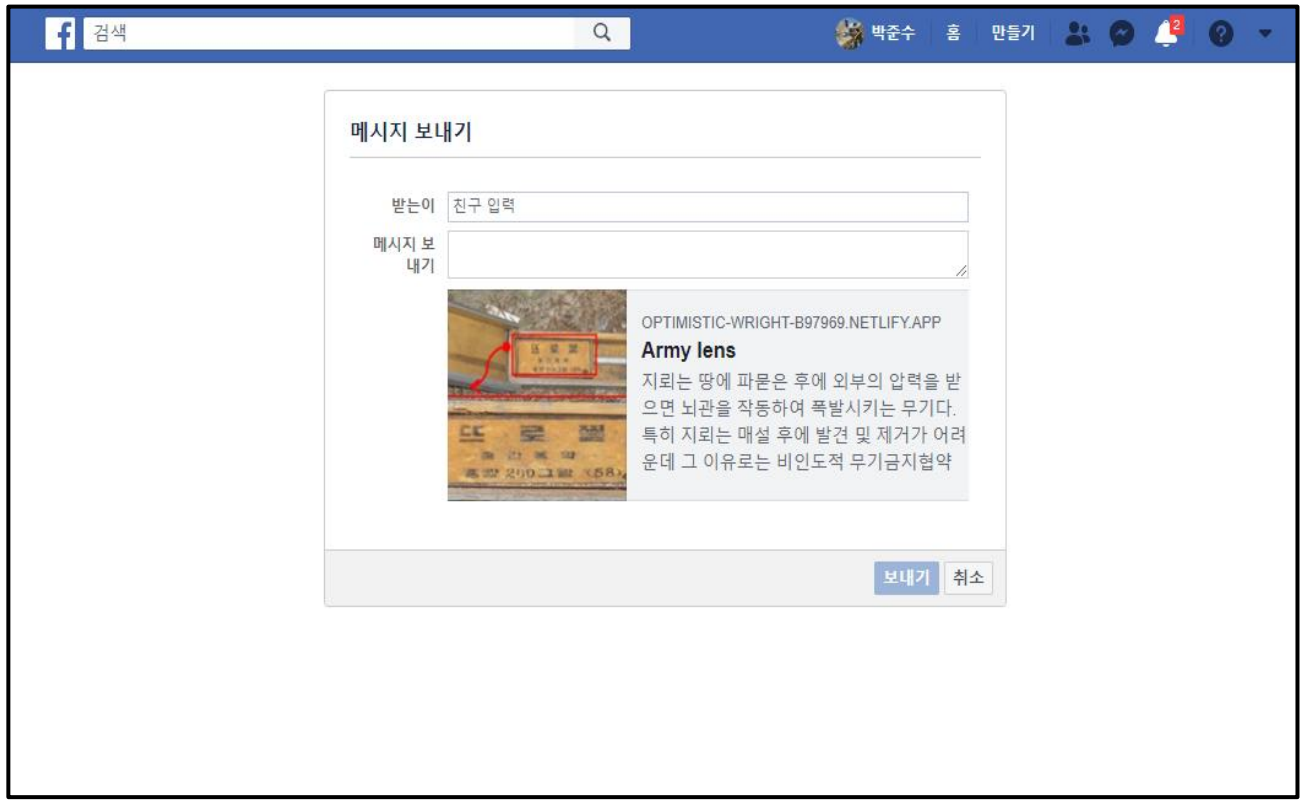
신속하고 간단한 지뢰식별 프로세스



Army Lens

1. 지뢰 식별 PAGE

신속하고 간단한 지뢰식별 프로세스



Army Lens

2. 지뢰 종류 PAGE

클릭 한번으로 쉽게 지뢰 관련 전문지식에 접근 가능

Army Lens

2. 지뢰 종류 PAGE

클릭 한번으로 쉽게 지뢰 관련 전문지식에 접근 가능

Army Lens

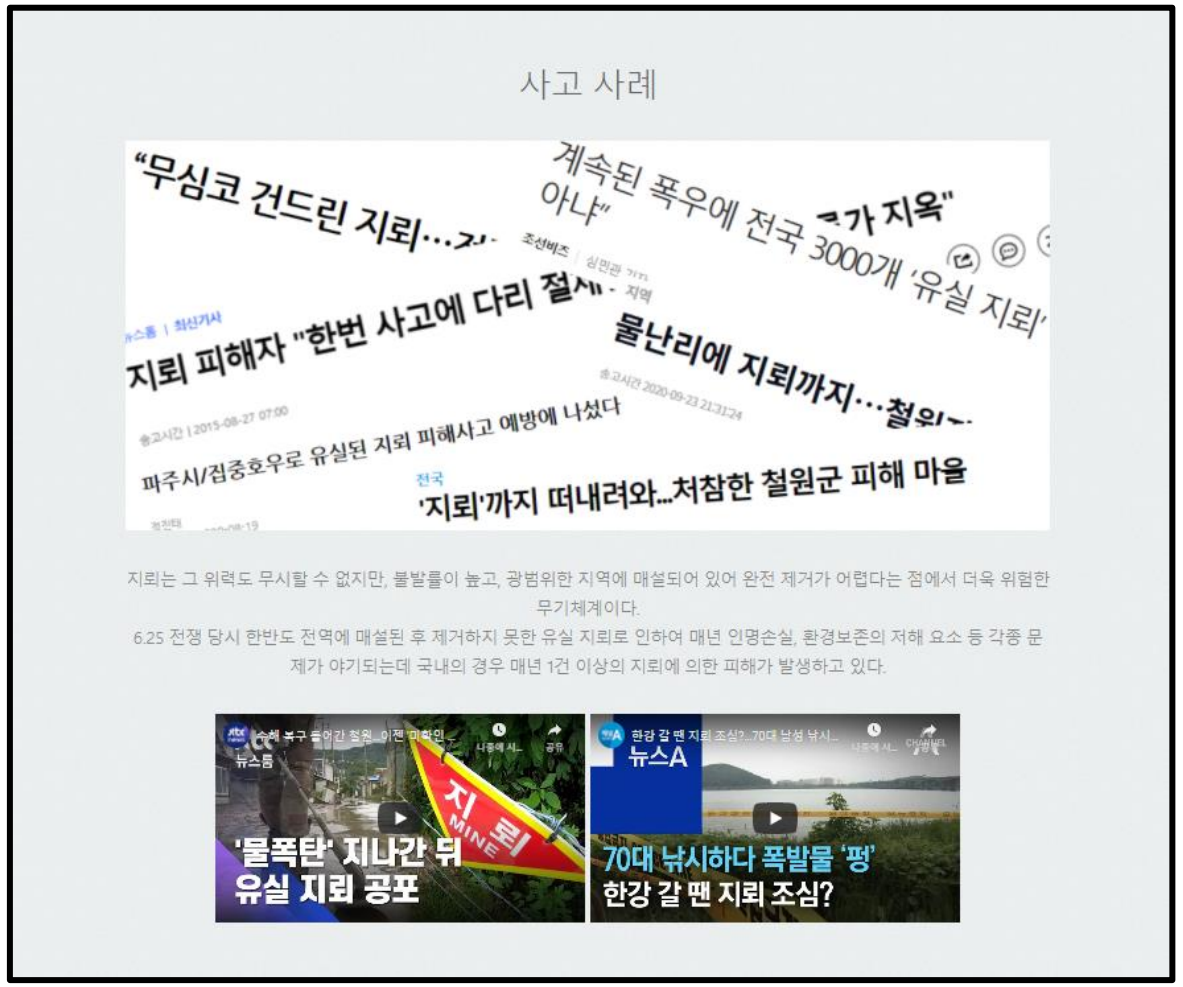
3. 사고 사례 PAGE

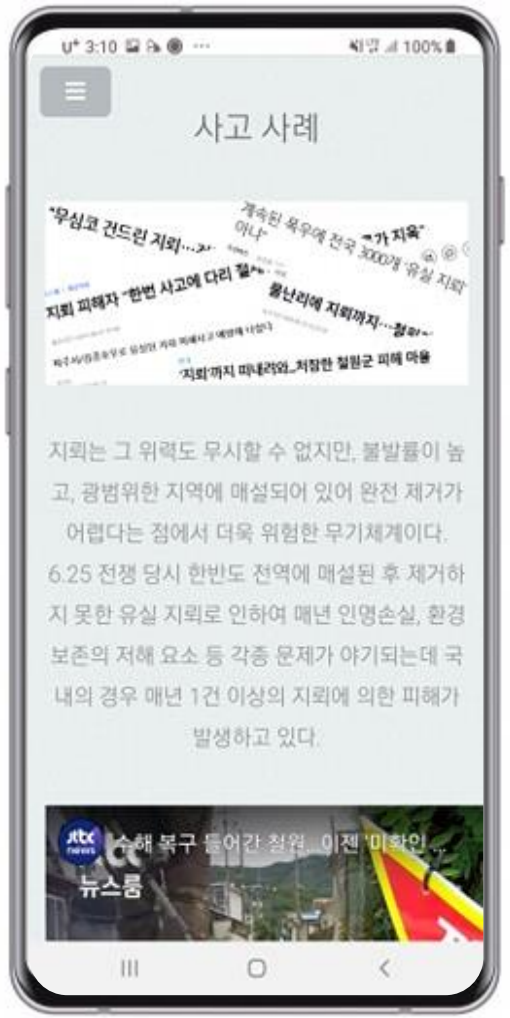
지뢰에 대한 경각심을

일깨워주는 다양한

사고사례 제공

-아래 링크를 클릭하여
관련 뉴스확인 가능-

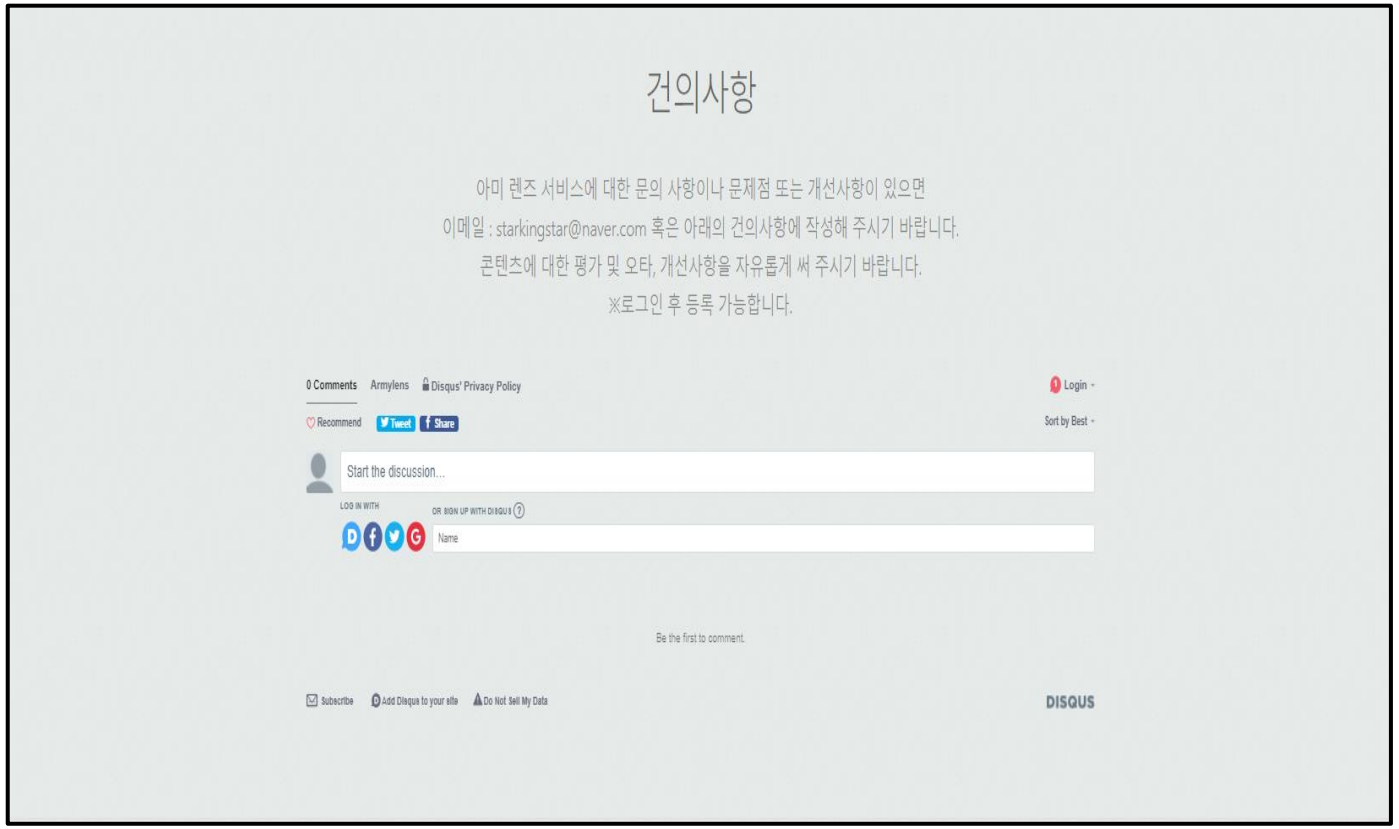




Army Lens

4. 건의 사항 PAGE

이용자는 건의사항을 통해 개발자에게 아이디어 건의 가능



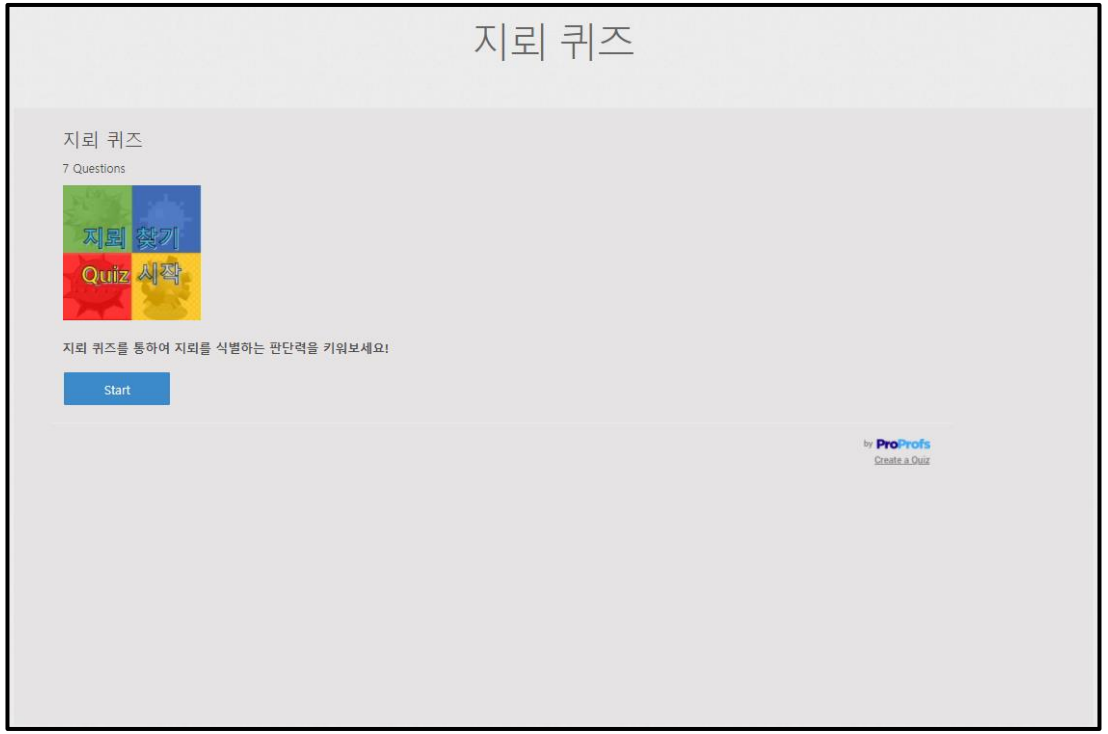
Army Lens

5. 지뢰 퀴즈 PAGE

퀴즈를 통해 학습하며

효과적인 지식 습득

-7개의 랜덤 문제와 오답노트 제공-



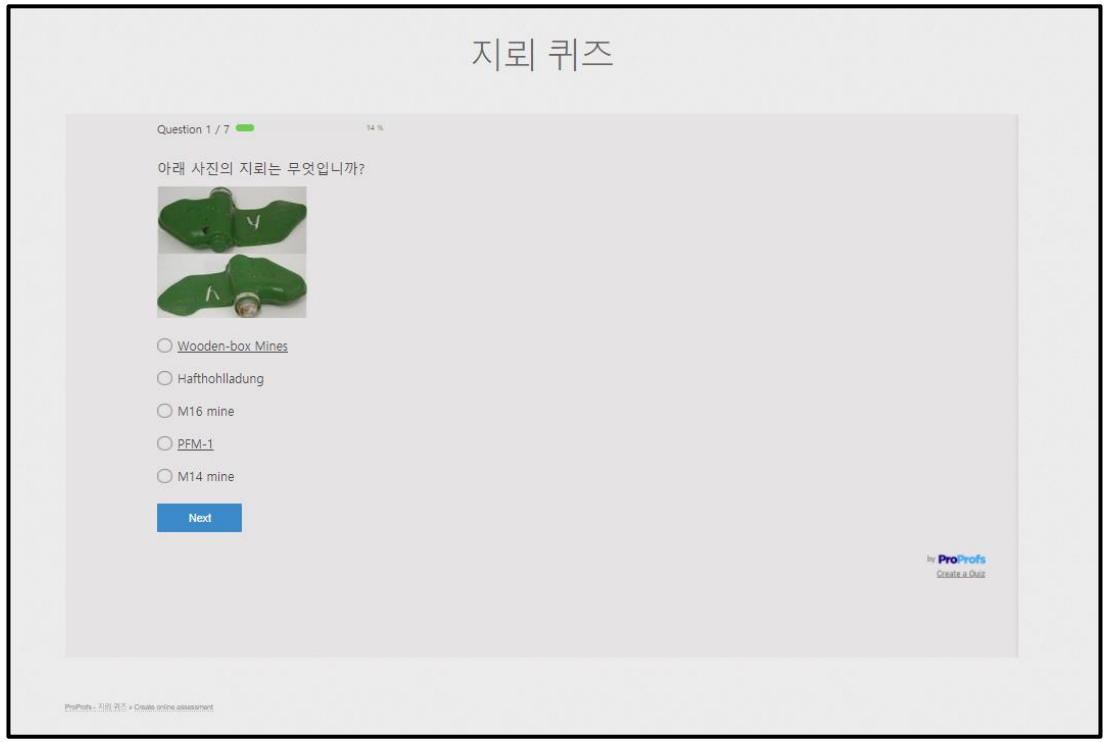
Army Lens

5. 지뢰 퀴즈 PAGE

퀴즈를 통해 학습하며

효과적인 지식 습득

-7개의 랜덤 문제와 오답노트 제공-



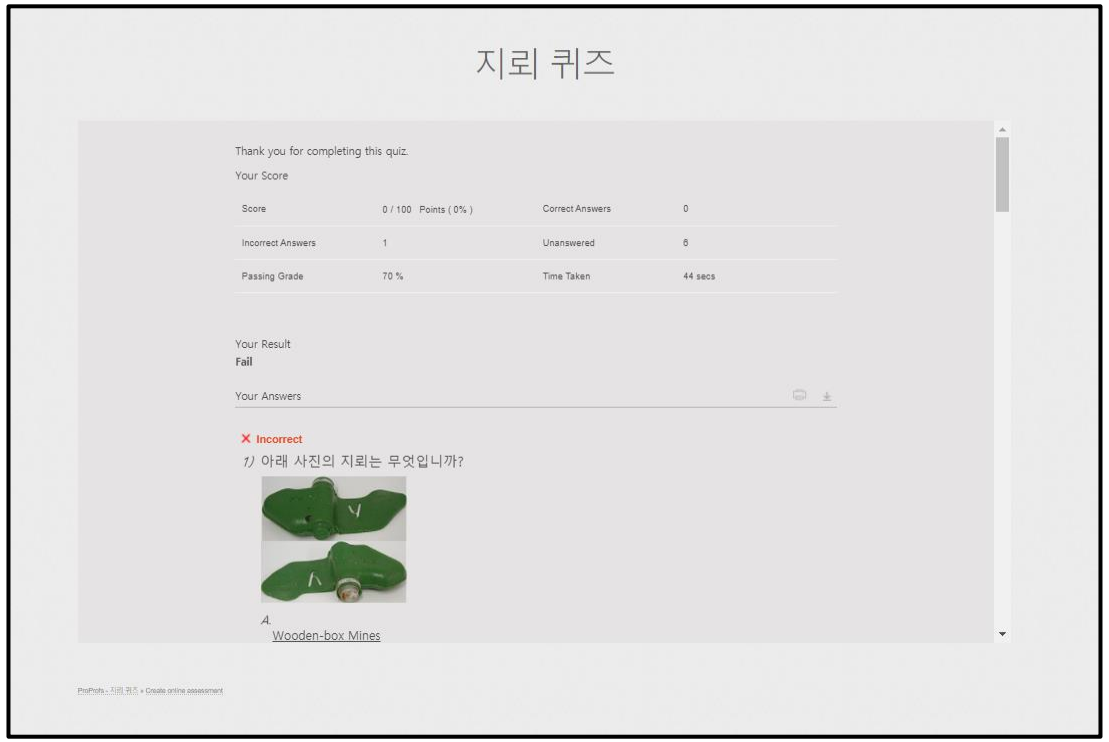
Army Lens

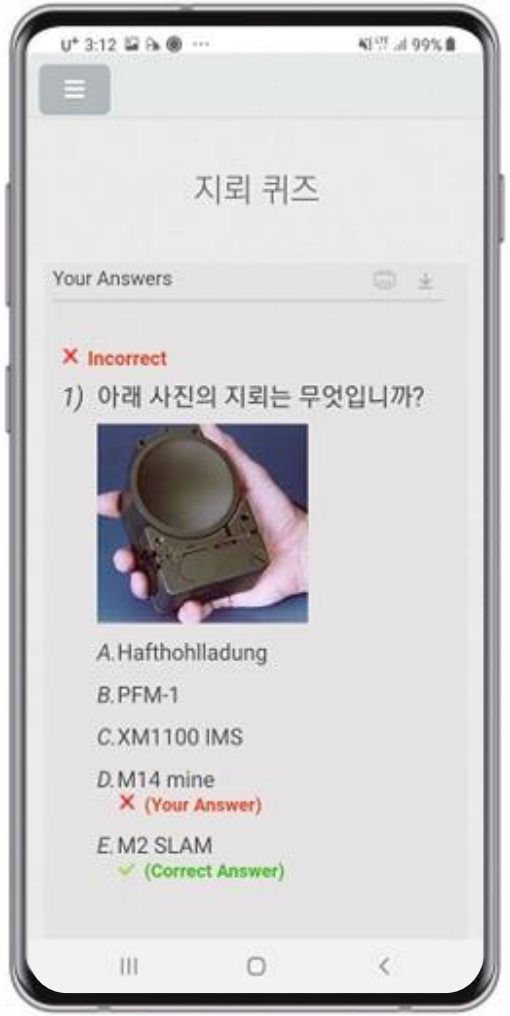
5. 지뢰 퀴즈 PAGE

퀴즈를 통해 학습하며

효과적인 지식 습득

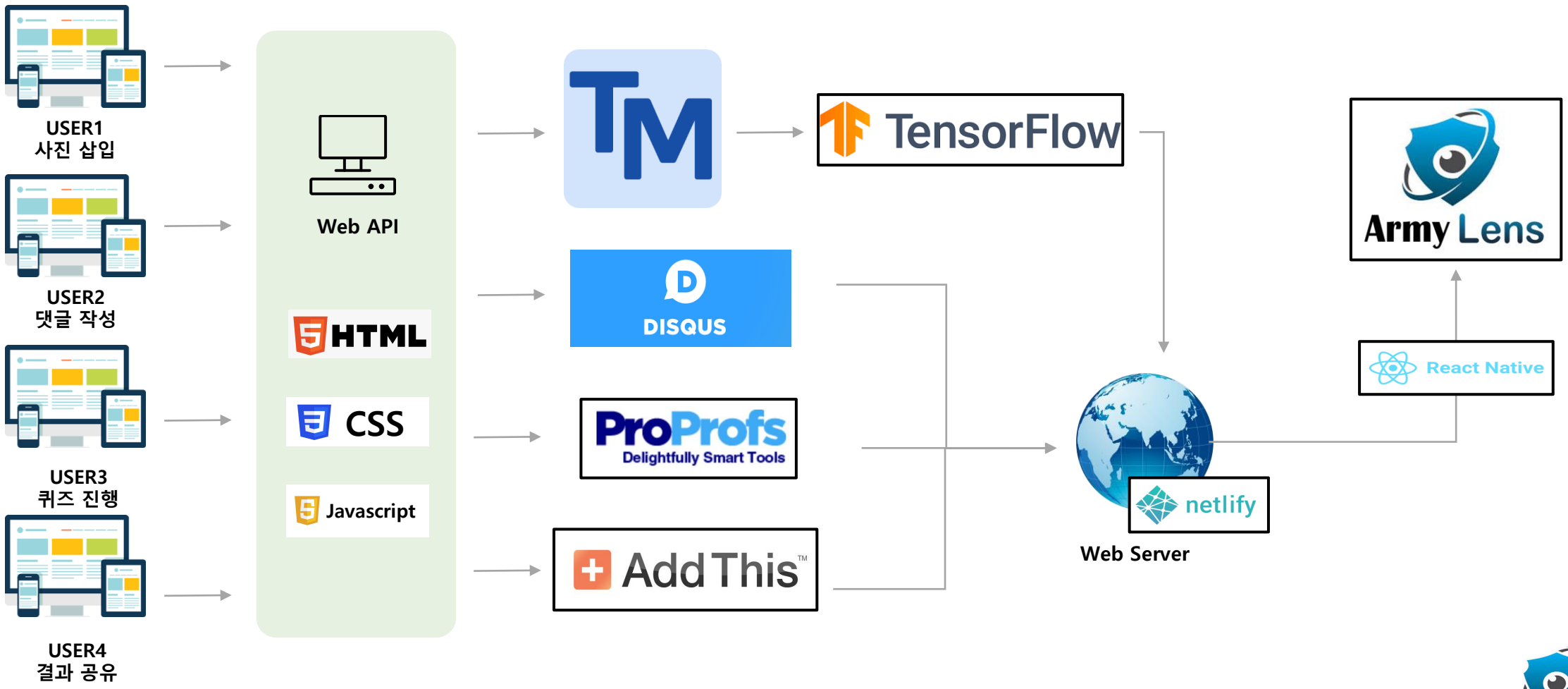
-7개의 랜덤 문제와 오답노트 제공-





Army Lens

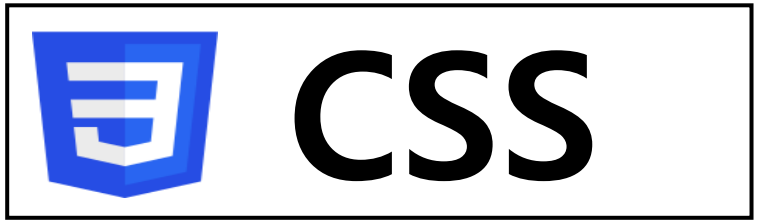
Data Architecture

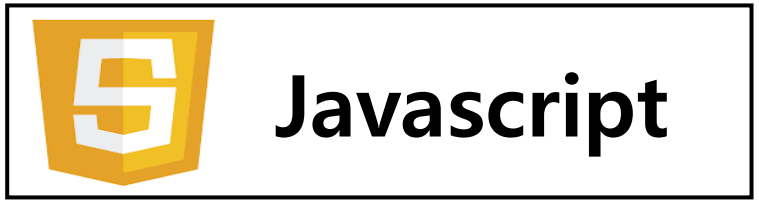


Army Lens

기술 스택

Frontend





Server(back-end)

기대 효과

모바일로 누구나 쉽게 지뢰를 식별하고 신고함으로써 유실 지뢰로 인한 민간인, 군인의 피해 감소

지뢰 식별, 신고 절차를 간편하게 만들어 소요 시간이 단축되고, 허위신고를 판단할 수 있어 비용이 감소한다.

지뢰 관련 사건 사고를 접함으로써 경각심 증가

지뢰에 관해 공부하고, 퀴즈를 통해 학습정도를 확인함으로써 군인 교육 활용 가능성

발전 가능성

-많은 군사정보를 가지고 있는 국방부의 data를 활용한다면 더욱 정확도 높은 머신 러닝 학습이 가능할 것이다.

-단순 지뢰 판별만이 아니라 무인기, 전차, 비행기 등 안보위협요소들을 통합하여 머신 러닝 학습을 진행한다면,

훈련, 경계근무 등 임무수행을 보조하는 어플로 활용함으로써 군인의 임무수행능력을 높일 수 있을 것이다.