Robust semi-supervised representation learning from uncurated data.

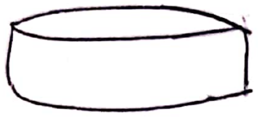
Part 1. large-scale representation learning.

P.1)

↳ deep layers are just for feature learning

self-supervised learning

P.2) <1>



cake.

self-supervised learning.

「cake genoise」

「지도 학습 = Icing, 강화학습 = cherry」

↓

좋은 learning 구조.

P.3)

large model + big data + many computation = good representation.

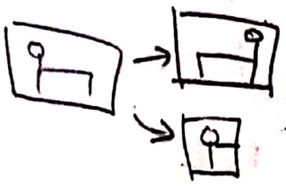
Big data = collected from un-/weakly-labeled sources.

↳ 사람이 하나하나 label 달기 어렵거나 저가로 외주 맡겨 설정가능한 data.

P.4) Scaling law (for 강화학습)

↳ unlabeled → self-지도학습.

① Joint embedding



) → 다른 구조의 이미지의 결과값 동일.

② masked autoencoder

→ 이미지 조개서 진행.

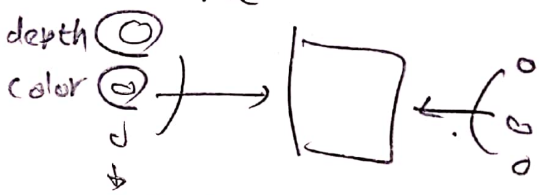
P.5) weakly-labeled → multimodal learning

「pair of image, text」

「≃ self-supervised learning, but with multiple modalities」

multimodal MAE.

Input source



각각 다른 요소 기준으로 선정한 input source

P.6) good representations?

goal = visual self-SL to scale on model, data, resolution

frontier research (선행연구)

= prior research

ViT (ICLR 20) = was scalable on model size (and data size) for 지도학습

「model / data size ↑ → 성능 ↑」

P.7)

P1 Visual self-지도학습 <2>

① ↳ contrastive learning on CNN.

worked well – MoCo, SimCLR.

↓

② Joint embedding on 'ViT'

– MoCo-v3

↳ ★ 아직, ViT(Joint embedding 사용하는) 은 model size 잘 조정x.

↓

③ ViT+MAE 「최근, 올해까지」

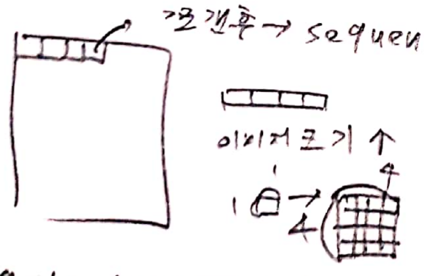
→ current SoTA (ViT-L, ViT-H)

P.8) ★(Meta)

MAE = data size/resolution 이 scale 되지x. (한계)

① ↳ MAE = 적은 data : 성능↑

But 10배 늘려도, 성능 gain ↓.

② 

longer sequence length : 한계.

P.9) practical pretrained models → need inductive bias?

↳ self-supervision & inductive bias = 흥미로운 research 방향.

↓

Inductive bias 실제로 좋은 지?

↓

P.10)

MAE > visual self-SL?

A.)??

↳ MAE : good 「low-level tasks (localization)」

↓

detection.

MAE : use minimal prior knowledge, pixel-level reconstructi

P.11) PAWS paper

↳ PAWS > self_SL ⊕ fine_tuning

↓

semi-SL extension of joint embedding self-SL.

$P(y|x_{u,1}^a)$, $P(y|x_{u,2}^a)$ label 있는 것, 없는 것 동일하게

↓

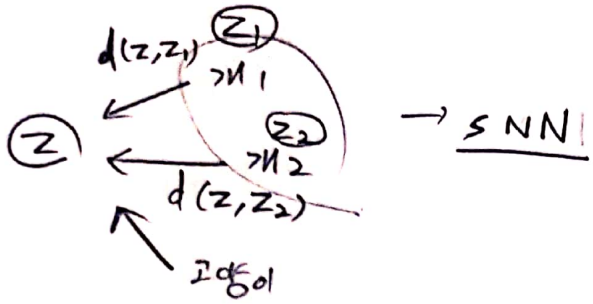
CE loss

↓

Cross entropy.

P.12)

PAWS : soft-nearest neighbor (SNN) classifier.



→ SNN!

시작

PAWS = semi-supervised learning → representation learning

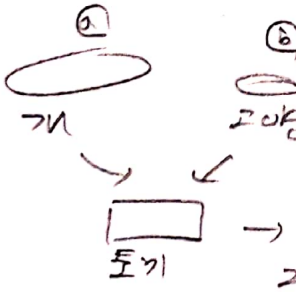
「발전 방향, 순서」

Part 2. RoPAWS

↳ semi-SL aims to learn a classifier for labeled data L, additionally using unlabeled data U.

out-of-class

↳ label과 완전히 관계없는 data.



<3>

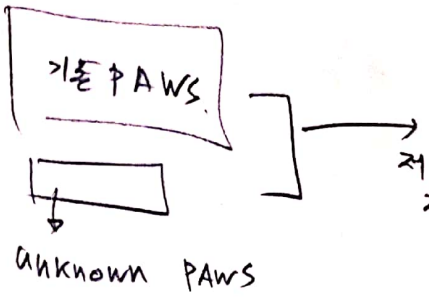
→ a, b를 기준으로 그에 가까운 것으로 판단.

↓

제자는 개(A), 고양이(A)도 아닌 unknown으로 구분하는

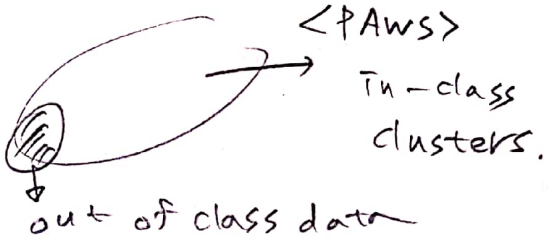
PAWS = generative classifier.

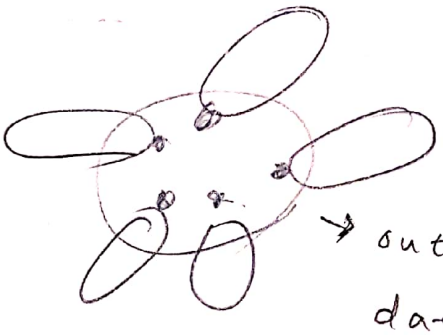
「00년대 관심사: 확률기반으로 구분하는 알고리즘」



→ 저자가 제안한 방법.

Untreated data도 예전과 달리 특성을 가리면, 좋은 data가 된다.





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part3) Meta Intern.

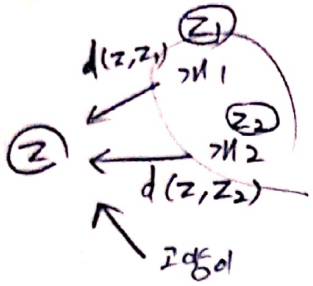
Intern 입에도.

① 64 GPU 사용

② FAIR cluster is managed by slum, and easy to run multi-node experiments.

P.12)

PAWS : soft-nearest neighbor (SNN) classifier.



→ SNN

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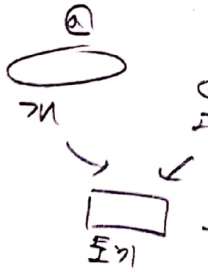


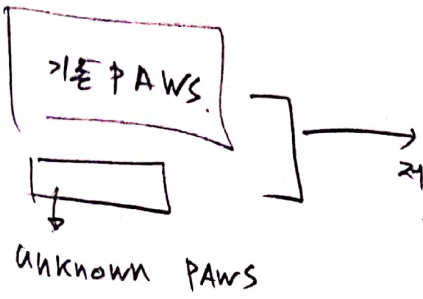
→ a, b 둘 기준으로 그에 가까운 것으로 판단.

↓

제시 = 개(A), 고양이(A) 도 아닌 unknown으로 구분하는 것 제안.

PAWS = generative classifier.

「OO년대 관심사: 확률적 방법으로 구분하는 알고리즘」



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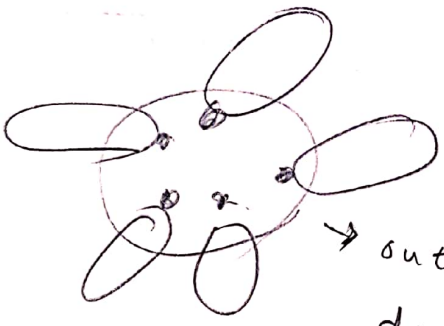

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② 우수한 연구자가 내부에 존재 ⑤ 성능 좀 떨어져도, simple 하면
④ 자유로운 콘스타트 업?
문제정형화 미흡.

좋다. ⇒ by removing less important modules.

---

google: ① chill life
② slow promotion 「승진속도 ↓」
③ prefer 'beautiful' yet complexed solutions: academic
「개발속도 ↓, 검증 ↑」 → code review 빡셈

meta — ① Tough life (tesla, apple, amazon) → even tougher for FAIR.
② simple and practical solution
「fast move」 → code review easy,
(Fast promotion.

(thus, young people prefer meta).

---

vertically = scale to ① model, ② data, ③ computation, etc.

Horizontally = applicable to various domains.

수많은 task에 적용가능 여부.
「vision, speech, text, RL」
= transformer 적용 잘된다.
(다양하게)

---

① plus type = google-like
↳ Find the problem of current method.

기존문제 ⊕ New

ex) RoPAWS

↕

② minus type = meta (FAIR vision team) - like.

↳ core 찾기

(simplify everything and find the core of the method (and strengthen it))

「방이도 설정중요」

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① FAIR Labs
↳ 대학원 연구실 분위기.

② Accel = large-scale
「대규모 project

③ AI4P → product. <4>
(full time RS focus on the)
↳ Interns do research.

Intern → 「LinkedIn, twitter, 공식 채용공고」
≪ 비율 ↑↑

↳ Interviewees 멘토링.

DM to one in FAIR from twitter ← Rejected since my research expertise was not fit.

인터뷰

① research 인터뷰

↳ 연구 내용, limitation, future work.

② coding interview

↳ easy level from LeetCode.

「but still need some practice」

Final remarks

↳ FAIR = 논문수 < impact

「한국 = 논문수 중요, but 영향력에 집중」

balance quality and quantity of research.

Interns → 연구의 목표가 [ ] 정해져 있고, 그것을 수행할 사람만 선발

vs

FAIR = 자유도 ↑

자유 ∝ 책임감

↳ 기간 내에 해결할 만한 연구주제 잡는다. → 정량적인 연구실적 때문에

「난이도 설정 중요」

인턴 → 정규직 = 2021년 전환율 ↑

(2022년 전환율 10% ↓

GPU resource 사용.

↳ 64 resource는 기본

(그 이후에 resource는 제안서 필요.

AI researcher

= CS 기반 비율 ↑

(Visual language) = 연구자

red team에는 산공 출신 ↑↑

(계산과학 쪽도 merit 있어보인다

월급: 세후 1000

↳ 물가 2~3배 여서

+. 실리콘밸리는 2~3억 있어야 벌고살만 하다.