Data Algorithm Governance 강의 계획서

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I. 개요

- 강의 목표: AI 비즈니스 실무자들이 알고리즘 거버넌스의 개념과 AI 규제 및 데이터 프라이버시 프레임워크를 이해함으로써 빅데이터 및 AI 기반 비즈니스 모델의 개발 및 적용과정에서 발생하는 윤리적, 법적 문제를 사전에 방지할 수 있도록 교육한다.
- 강의 방식: 실무 사례 중심의 강의, 수업 중 토론, 학생 개별 발표

II. 수업 목표

- 데이터 사용과 프라이버시, 알고리즘 설계와 AI 리스크, 거버넌스, 편향과 AI 공정성 등의 개념을 이해하여 기업의 법적/윤리적 리스크를 최소화하는 AI 비즈니스 모델을 구축한다
- AI 알고리즘 사례 분석: 금융, 의료, 채용 등 다양한 산업 분야에서 데이터 알고리즘을 활용한 사례를 분석하여 실질적인 비즈니스 가치 창출 전략을 수립한다.
- 실무 중심의 거버넌스 : 데이터 수집부터 폐기까지 전 단계에 걸친 거버넌스 프로세스, 데이터 전저리를 통해 알고리즘 편향이 최소화된 안전한 AI 시스템을 구축한다.
- 투명성, 신뢰가능성, 설명가능성을 갖춘 인공지능(XAI) 개발의 목적을 이해하고 실제 비즈니스에서 신뢰가능한 AI 시스템을 구현할 수 있도록 교육한다.

III. 강의 주제

1 주차 (Sept 2): 데이터 프라이버시, 가명정보 처리, EU 데이터보호규정(GDPR)

- 데이터 프라이버시의 중요성 https://www.ibm.com/kr-ko/topics/data-privacy
- 개인정보보호위원회, 가명정보 처리 가이드라인(2024.2.) https://www.pipc.go.kr/np/cop/bbs/selectBoardArticle.do?bbsId=BS217&mCode=D010 030000&nttId=9900#LINK; https://www.shinkim.com/kor/media/newsletter/2342
- 개인정보보호위원회, AI 개발·서비스를 위한 공개된 개인정보 처리 안내서 (2024.7) https://www.pipc.go.kr/np/cop/bbs/selectBoardArticle.do?bbsId=BS074&mCode=C020 010000&nttId=10362#LINK
- 개인정보보호위원회,'이루다'개발사 ㈜스캐터랩에 과징금·과태료 등 제재 처분 (2021) https://www.pipc.go.kr/np/cop/bbs/selectBoardArticle.do?bbsId=BS074&mCode=C020 010000&nttId=7298
- 약국관리 프로그램 'Pharm Manager 2000'을 제작한 약학정보원(KPIC)이 암호화된 환자 개인정보 등을 환자들의 동의를 받지 않고 한국 IMS 헬스데이터에게 공급한 사례 (민사 1) https://www.boannews.com/media/view.asp?idx=80239 (민사 2) https://www.doctorsnews.co.kr/news/articleView.html?idxno=129093 (형사) http://www.dailypharm.com/Users/News/NewsView.html?ID=313507
- Survey on Data Collection for Machine Learning https://arxiv.org/pdf/1811.03402

- Preserving Privacy While Sharing Data 2022 MIT Sloan Management Review https://sloanreview.mit.edu/article/preserving-privacy-while-sharing-data/
- 차분 프라이버시(Differential Privacy)의 가능성과 한계 https://sapi.co.kr/wp-content/uploads/2020/05/차분-프라이버시의-가능성과-한계-구본효.pdf
- FTC Releases 2023 Privacy and Data Security Update https://www.ftc.gov/news-events/news/press-releases/2024/03/ftc-releases-2023-privacy-data-security-update
- Preserving Privacy in AI Applications through Anonymization of Sensitive Data https://www2.deloitte.com/content/dam/Deloitte/de/Documents/Innovation/Deloitte_T rustworthy%20AI%20_Data%20Anonymization_Feb2022.pdf
- 데이터 프라이버시 문제에 대한 통계적 접근과 관련 이슈 https://repository.kihasa.re.kr/bitstream/201002/30210/1/2018.08%20No.262.05.pdf
- 개인 데이터 통합, 마이데이터(MyData) 사업, 개인신용정보전송요구권 https://www.mydatacenter.or.kr:3441/myd/mydsvc/sub1.do

2 주차 (Sept 9): AI 비즈니스의 알고리즘 활용과 공정거래법의 쟁점

- 비즈니스 기회 창출을 위한 AI 알고리즘의 활용 https://assets.kpmg.com/content/dam/kpmg/kr/pdf/kr-im-ai-algorithm-201806.pdf
- '알고리즘 조작' 논란 확산···플랫폼 보험 중개, 공정경쟁 저해 우려 www.fins.co.kr/news/articleView.html?idxno=95997
- 플랫폼의 보험상품 취급과 알고리즘 사전 검증 https://shorturl.at/HFBVQ
- Shoppers Are Caught Off Guard as Prices on Everyday Items Change More Often https://www.wsj.com/articles/shoppers-are-caught-off-guard-as-prices-on-everyday-items-change-more-often-11643970606
- Retailers, Are You Getting the Full Value of Your Dynamic Pricing Strategy?
 https://www.bain.com/how-we-help/retailers-are-you-getting-the-full-value-of-your-dynamic-pricing-strategy/
- 알고리즘으로 가격 차별···'다이나믹 프라이싱' https://www.lawtimes.co.kr/news/181985
- Amazon used an algorithm to essentially raise prices on other sites, the FTC says https://www.nbcnews.com/business/business-news/amazon-used-algorithm-essentially-raise-prices-rcna123410
- 알고리즘을 이용한 Amazon.com 의 PB(Private Brand) 랭킹 조작: FTC, State of Washington vs. Amazon.com https://www.ftc.gov/news-events/news/press-releases/2023/09/ftc-sues-amazon-illegally-maintaining-monopoly-power
- 알고리즘을 이용한 쿠팡과 씨피엘비(CPLB)의 PB(Private Brand) 랭킹 조작 (공정거래위 과징금 부과 사례) https://t.ly/a_1CE
- 전자상거래에서의 소비자 오인 가능성과 알고리즘 공개의무 https://sapi.co.kr/wp-content/uploads/2021/09/전자상거래에서의-소비자-오인-가능성과-알고리즘-공개의무_0923_2.pdf

3주차 (Sept 16) 합성데이터/ 얼굴 인식 AI 모델 (추석 휴강. 온라인 보강 Sept 21.2pm)

- AI models fed AI-generated data quickly spew nonsense https://www.nature.com/articles/d41586-024-02420-7
- Best Practices and Lessons Learned on Synthetic Data for Language Models https://arxiv.org/pdf/2404.07503v1

- 안면인식기술의 법적 쟁점: 데이터 수집 단계의 법적 리스크 https://sapi.co.kr/wp-content/uploads/2021/09/%EC%95%88%EB%A9%B4%EC%9D%B8%EC%8B%9D%EA%B8%B0%EC%88%A0%EC%9D%98-%EB%B2%95%EC%A0%81-%EC%9F%81%EC%A0%90_0923_2.pdf
- Artificial intelligence, algorithms, and social inequality https://compass.onlinelibrary.wiley.com/doi/full/10.1111/soc4.12962
- AI bias: Why fair artificial intelligence is so hard to make www.vox.com/future-perfect/22916602/ai-bias-fairness-tradeoffs-artificial-intelligence
- Racial Discrimination in Face Recognition Technology https://sitn.hms.harvard.edu/flash/2020/racial-discrimination-in-face-recognition-technology/
- Facebook to Pay \$550 Million to Settle Facial Recognition Suit https://www.nytimes.com/2020/01/29/technology/facebook-privacy-lawsuit-earnings.html
- ACLU v. Clearview AI https://www.aclu.org/cases/aclu-v-clearview-ai
- Sam Altman's Eye-Scanning Worldcoin Venture Blocked in Spain https://www.wsj.com/tech/cybersecurity/sam-altmans-eye-scanning-worldcoin-venture-blocked-in-spain-057b7b14
- Managing Data Privacy Risk in Advanced Analytics, MIT Sloan Management Review https://sloanreview.mit.edu/article/managing-data-privacy-risk-in-advanced-analytics/
- Rite Aid Corporation, FTC v. <u>www.ftc.gov/legal-library/browse/cases-proceedings/2023190-rite-aid-corporation-ftc-v</u>
- FTC Signals Tough Line in First AI Discrimination Case Under Section 5 <u>www.perkinscoie.com/en/news-insights/ftc-signals-tough-line-in-first-ai-discrimination-case-under-section-5.html</u>

4 주차 (Sept 22): AI 편향, 유럽연합(EU AI Act)과 미국의 AI 규제

- 편향적 인공지능: 알고리즘으로 재생산되는 편향의 원인과 유형 http://cdss.yonsei.ac.kr/index.php/issue-brief/?mod=document&uid=128
- Shedding light on AI bias with real world examples,
- https://www.ibm.com/blog/shedding-light-on-ai-bias-with-real-world-examples/
- Why AI bias can hurt your business, The Wired https://www.wired.com/sponsored/story/why-ai-bias-can-hurt-your-business-ey/
- What Do We Do About the Biases in AI? Harvard Business Review https://hbr.org/2019/10/what-do-we-do-about-the-biases-in-ai
- Data, Power and Bias in Artificial Intelligence
 https://crcs.seas.harvard.edu/sites/projects.iq.harvard.edu/files/crcs/files/ai4sg_2020_p
 aper 81,pdf
- AI 채용 문제점 ① 편향된 데이터로는 공정한 채용이 불가능 https://service.prism.work/insight/?q=YToyOntzOjEyOiJrZXl3b3JkX3R5cGUiO3M6Mzoi YWxsIjtzOjQ6InBhZ2UiO2k6MTt9&bmode=view&idx=14131229&t=board
- Organizations Face Challenges in Timely Compliance With the EU AI Act https://sloanreview.mit.edu/article/organizations-face-challenges-in-timely-compliance-with-the-eu-ai-act/

- Manage AI Bias Instead of Trying to Eliminate It, MIT Sloan Management Review https://sloanreview.mit.edu/article/manage-ai-bias-instead-of-trying-to-eliminate-it/
- US Federal Trade Commission (FTC) Guideline Using Artificial Intelligence and Algorithms https://www.ftc.gov/business-guidance/blog/2020/04/using-artificial-intelligence-algorithms

5 주차 (Sept 29): AI 리스크, 신뢰성, 알고리즘 거버넌스

- AI: These are the biggest risks to businesses and how to manage them https://www.weforum.org/agenda/2023/07/ai-biggest-risks-how-to-manage-them/
- AI's Trust Problem, Harvard Business Review 2024 https://hbr.org/2024/05/ais-trust-problem
- 금융산업에서의 AI 활용 방안에 따른 리스크 요인 분석 (자본시장연구원) https://www.kcmi.re.kr/common/downloadw.php?fid=26494&fgu=002002&fty=004003
- 금융분야 AI 활용 활성화 및 신뢰확보 방안 (금융위원회 FSC) https://www.fsc.go.kr/no010101/78235?srchCtgry=&curPage=&srchKey=&srchText=&srchBeginDt=&srchEndDt=
- Eliminating Algorithmic Bias Is Just the Beginning of Equitable AI, Harvard Business Review https://hbr.org/2023/09/eliminating-algorithmic-bias-is-just-the-beginning-of-equitable-ai
- Auditing Algorithmic Risk, MIT Sloan Management Review (2024) https://sloanreview.mit.edu/article/auditing-algorithmic-risk/
- Avoid ML Failures by Asking the Right Questions, MIT Sloan Management Review https://sloanreview.mit.edu/article/avoid-ml-failures-by-asking-the-right-questions
- Algorithmic governance https://policyreview.info/concepts/algorithmic-governance
- Managing algorithmic risks Safeguarding the use of complex algorithms and machine learning https://www2.deloitte.com/content/dam/Deloitte/us/Documents/risk/us-risk-algorithmic-machine-learning-risk-management.pdf
- AI 리스크에 대한 글로벌 대응 동향 및 시사점 https://www.samsungsds.com/kr/insights/ai-risks-and-responses.html
- Assessing Risks and Impacts of AI (ARIA), US NIST https://ai-challenges.nist.gov/uassets/6; https://ai-challenges.nist.gov/aria

6 주차 (Oct 7): 학생 독립 발표

• 강의 계획서의 자료 중 흥미를 느끼는 테마의 사례들을 선택하여 심층분석 (25-30분)

7주차 (Oct 14): 공공영역의 알고리즘 책무성, 투명성, 설명가능성

- When—and—Why You Should Explain How Your AI Works, Harvard Business Review. https://hbr.org/2022/08/when-and-why-you-should-explain-how-your-ai-works
- Investigation into France CNAF's Algorithm for Mass Profiling in Welfare System https://www.lighthousereports.com/methodology/how-we-investigated-frances-mass-profiling-machine

- The flawed algorithm at the heart of Robodebt (Australia's automated system) https://pursuit.unimelb.edu.au/articles/the-flawed-algorithm-at-the-heart-of-robodebt
- This Algorithm Could Ruin Your Life (Dutch city of Rotterdam's welfare algorithm) https://www.wired.com/story/welfare-algorithms-discrimination
- 3.3 Transparency and Explainability in Artificial Intelligence Index Report 2024 Stanford University (pp. 180-185) https://aiindex.stanford.edu/wp-content/uploads/2024/04/HAI_2024_AI-Index-Report.pdf
- Requirements for Trustworthy Artificial Intelligence
 https://scholarworks.indianapolis.iu.edu/server/api/core/bitstreams/c748d7f0-5d6b-4f09-9467-f69db4eb6f07/content
- AI-Related Risks Test the Limits of Organizational Risk Management (Pros/ Cons)
 https://sloanreview.mit.edu/article/ai-related-risks-test-the-limits-of-organizational-risk-management/
- 설명가능한 AI 란 무엇인가? https://www.ibm.com/kr-ko/topics/explainable-ai
- 설명가능한 인공지능(Explainable AI; XAI) 연구동향과 시사점 (PDF)
- AI 신뢰성을 위한 XAI 기술 동향 (PDF)
- The Foundation Model Transparency Index 2024 https://crfm.stanford.edu/fmti/May-2024/index.html
- "알고리즘 통제: 투명성의 구체적 기준" https://sapi.co.kr/wp-content/uploads/2021/09/알고리즘-통제-투명성의-구체적-기준 0923 2.pdf
- Algorithm Accountability: France, the Digital Republic Law https://www.ogpstories.org/algorithm-accountability-what-government-can-do-right-now/
- EU Artificial Intelligence Act 1) https://artificialintelligenceact.eu/high-level-summary/ 2) 한국어 번역문 https://www.klri.re.kr/kor/data/S/1026/view.do

8 주차 (Oct 21): 중간고사

• 제시하는 이슈를 분석하여 수기로 작성 후 pdf 스캔. 당일 자정까지 제출 (학점 20%) 주어진 주제/이슈의 분석은 학생이 독립적으로 수행해야 함.

9 주차 (Oct 28): AI 헬스케어와 알고리즘

- Does AI Help or Hurt Human Radiologists' Performance? It Depends on the Doctor https://hms.harvard.edu/news/does-ai-help-or-hurt-human-radiologists-performance-depends-doctor
- 미국 건강보험 이동성 및 책임법(HIPAA)에 의한 보건의료데이터 개인정보 보호 https://www.kiri.or.kr/pdf/연구자료/연구조사자료/rs-2014-07_09.pdf
- 미국 HIPAA 규정을 준수하며 Google 애널리틱스를 사용하기 https://support.google.com/analytics/answer/13297105?hl=ko
- 보건복지부, 「보건의료데이터 활용 가이드라인」: 가명처리 방법 2024 www.mohw.go.kr/board.es?mid=a10501010000&bid=0003&list_no=1480106&act=view
- Patient data for commercial companies ethical framework for sharing patients' data https://jme.bmj.com/content/early/2023/05/24/jme-2022-108781

- How Health Care Algorithms and AI Can Help and Harm https://publichealth.jhu.edu/2023/how-health-care-algorithms-and-ai-can-help-and-harm
- A Health Care Algorithm Offered Less Care to Black Patients www.wired.com/story/how-algorithm-favored-whites-over-blacks-health-care
- "Millions of black people affected by racial bias in health-care algorithms" Nature https://www.nature.com/articles/d41586-019-03228-6
- DeepMind's Streams app faces legal action over NHS data use https://www.cnbc.com/2021/10/01/google-deepmind-face-lawsuit-over-data-deal-with-britains-nhs.html
- Prediction of respiratory failure risk in patients with pneumonia in the ICU https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0291711

10 주차 (Nov 4): AI Agents / 다크패턴 UX 와 소비자 보호

- We Need to Control AI Agents Now (Jonathan Zittrain)
 www.theatlantic.com/technology/archive/2024/07/ai-agents-safety-risks/678864/
- 2010 Flash Crash in The Stock Market https://corporatefinanceinstitute.com/resources/equities/2010-flash-crash/
- Practices for Governing Agentic AI Systems (OpenAI) https://cdn.openai.com/papers/practices-for-governing-agentic-ai-systems.pdf
- Dark Patterns, the tricks websites use to make you say yes, explained https://www.vox.com/recode/22351108/dark-patterns-ui-web-design-privacy
- Dark Patterns: Legal Cases https://www.deceptive.design/cases
- FTC Sues Amazon.com for Enrolling Prime Users 'Without Consent' www.thewrap.com/ftc-sues-amazon-prime-enrolling-users-without-consent/
- TikTok held liable for nudging children towards privacy-intrusive settings (EU)
 https://www.edpb.europa.eu/our-work-tools/consistency-findings/register-decisions/2023/decision-matter-tiktok-technology_en
- Beyond Dark Patterns: A Concept-Based Framework for Ethical Software Design https://arxiv.org/pdf/2310.02432
- Dark Patterns will now be heavily regulated https://www.williamfry.com/knowledge/dark-patterns-not-a-new-concept-but-will-now-be-heavily-regulated/
- 다크패턴 관련 규제동향 https://www.shinkim.com/kor/media/newsletter/pdf/2181
- '다크패턴'에 대한 공정거래위원회 자율관리가이드라인 https://www.ftc.go.kr/www/selectReportUserView.do?key=10&rpttype=1&report_data_ no=10140

11 주차 (Nov 11): 학생 독립 발표

• 강의 계획서의 자료 중 흥미를 느끼는 테마의 사례들을 선택하여 심층분석 (25-30분)

12 주차 (Nov 18): 형사사법 시스템과 알고리즘.

- Analysis of the Correctional Offender Management Profiling for Alternative
 Sanctions (COMPAS) Recidivism Algorithm https://www.propublica.org/article/how-we-analyzed-the-compas-recidivism-algorithm
- The accuracy, fairness, and limits of predicting recidivism https://www.science.org/doi/10.1126/sciadv.aao5580
- Can you make AI fairer than a judge? Play our courtroom algorithm game https://www.technologyreview.com/2019/10/17/75285/ai-fairer-than-judge-criminal-risk-assessment-algorithm/
- Societal Impacts of Predictive Policing Algorithms (PPAs) in Crime Prevention https://libraetd.lib.virginia.edu/downloads/x059c832h?filename=Smith_Joshua_STS_Research_Paper.pdf
- Artificial Intelligence in Predictive Policing Issue Brief https://naacp.org/resources/artificial-intelligence-predictive-policing-issue-brief
- Predictive policing algorithms are racist. They need to be dismantled.
 https://www.technologyreview.com/2020/07/17/1005396/predictive-policing-algorithms-racist-dismantled-machine-learning-bias-criminal-justice/
- Law Enforcement and Data-Driven Predictions https://t.ly/Y3Tan
- Robert Williams Arrest Case: Facial Recognition Led to Wrongful Arrests <u>www.nytimes.com/2024/06/29/technology/detroit-facial-recognition-false-arrests.html</u>

13 주차 (Nov 25): AI 학습 데이터, 저작권, 공정이용

- AI 학습과 뉴스 저작권 간의 '공정이용' 갈등 https://www.lawtimes.co.kr/LawFirm-NewsLetter/196993
- 생성형 AI 와 저작권 쟁점 https://www.datocms-assets.com/45669/1701306602-231128-12.pdf
- Eight newspaper publishers sue Microsoft and OpenAI over copyright infringement https://www.cnbc.com/2024/04/30/eight-newspaper-publishers-sue-openai-over-copyright-infringement.html
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- Reexamining "Fair Use" in the Age of AI https://hai.stanford.edu/news/reexamining-fair-use-age-ai
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IV. 발표 주제의 선정

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- 국제 컨퍼런스 자료 AAAI/ACM Conference on AI, Ethics, and Society 참고

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VI. 평가 방법 및 커뮤니케이션 규칙

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