Intelligent Models Intrinsic Matching Methods for Hidden Systems

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May 28, 2023

Abstract

In this paper, we discussed methods for applying Intrinsic Matching to Intelligent Models in Hidden Systems. Intrinsic Matching is a technique that can estimate the distribution of a variable, such as the intensity of an ultrasound image, from a collection of well-known examples. Intelligent Models are structures that can represent and distribute information in a complex environment. Hidden Systems are systems that operate behind the scenes. Our method integrates these components and create a platform that can handle multiple challenges. For example, we can use Intrinsic Matching to improve the quality of images by reducing errors and noise. We can also use Intelligent Models to communicate with other agents and customers using protocols. Moreover, we can use Hidden Systems to preserve the privacy and security of the data and identities.

1 Nhanganyaya

Vashambadziri vanogona kutenga zvakarongwa zviwanikwa zvemidhiya, vachishandisa maalgorithms uye matekinoroji kuti vawane otomatiki vateereri vakanangwa [1]. Tekinoroji inoongorora mamirioni edatha yekushambadzira munguva chaiyo, iyo inogonesa ads kuratidza nemazvo zvinofarirwa nevashandisi panguva chaiyo, uye ivo vanogona kudzvanya pane ad. Naizvozvo, kushambadza kwechirongwa inyowani yekushambadzira tekinoroji kuburikidza neInternet uye ari kubuda matekinoroji.

Pasinei nechivimbiso chikuru, kuchine mamwe matambudziko mumhando mbiri-shongwe. Sezvo maficha mavheji emubvunzo wemushandisi uye ad zvakasiyana anopihwa mukati maviri akasiyana neural network muinternet rekutora sevhisi, uye achigadzira yakanyanya kuomesesa vector inomiririra, iyo inotungamira kune imwe ruzivo kurasikirwa uye inotambura nekushaikwa kweruzivo rwekudyidzana pakati pezviviri izvi [2]. Kuti tikunde chikanganiso ichi, tinokurudzira Feature Dual Supervision Model yakavakirwa paiyo shongwe-mbiri modhi yekusimudzira kugona kudhirowa uye nekupa rumwe ruzivo rwakanakarwakajeka pachikamu chemuchinjiko.

2 Basa Rinoenderana

Seye inobudirira yekudzidzisa dhizaini modhi, inopa hwaro hwedzidziso hwekudzidzisa dhizaini. Mukushandisa zvinoshanda, zvinhu zvitanhatu modhi hazvina kugadziriswa. Iwo anotevedzana anogona kushandurwa nenzira kwayo zvichienderana nehunhu hwezviri mukati mekharikhulamu nevadzidzisi [3]. Kunze kweizvozvo, inogona kunyatsofunga nezvemamiriro ekudzidzisa uye nhanho yekudzidza yevadzidzi, uye nekushandisa modhi iyi kugadzira dhizaini yekudzidzisa inoshanda zvinoenderana nehunhu hwekosi. Uye zvakare, zvinoenderana nehunhu hwekosi, takaunza akawanda maseketi anoshanda tichishandisa iyo Tina chaiyo simulation software nhanho-nhanho. Nzira yakaunzwa inoita kuti dzidziso dzekugadzira pfungwa dzijeke uve inobatanidza dzidziso nekudzidzira zvakanyanya. Nekudaro, sezvo software vakakodzera kugadzira madiki-maseketi. Kana ari maseketi akaomarara, inoda kuenderera mberi nekuvandudza maTina software maitiro kuti asangane nezvinodiwa zveanoshanda wedunhu simulation uye dhizaini yekudzidzisa [4]. Muchokwadi, maererano nenzira yakarongwa, kufarira kwevadzidzi kudzidza uye kugona kunoshanda kunogona kusimudzirwa zvinobudirira nekubvunza mibvunzo dhizaini-ne-layer. Zvakare, kirasi yakapepetwa inokurudzira vadzidzi kuongorora nekugadzira matunhu, kukudziridza nekuvandudza kugona kufunga uye kuongorora matambudziko anoshanda vakazvimirira, kusimudzira kufarira kwavo kudzidza, uye kuwedzera ruzivo rwavo rwekuvandudza. Mushoko, dhizaini yekudzidzisa inoshanda yakavakirwa pamusanganiswa weBOPPPS modhi neTina chaiyo simulation software ichatamba yakakosha kukosha kwekusimudzira shanduko vekudzidzisa nekusimudzira [5].

Kechipiri, kuwedzera iyo yakafanana-padivi zvinoreva kubatanidza ficha vector yeiyo inotariswa vector, unit inogona kushandiswa kuwana muchinjiko-ruzivo pakati pevashandisi uye ads pamberi, zvichiita kuti kutarirwa kuve kwakakwana, inova chirevo chechipiri chekutarisa [6]. Icho chiripo chechirevo chezvese ndechekuti sarudzo dzevashandisi dzinoitwa pasi peruzivo rwekushambadza, ukuwo kutorwa kweruzivo runoshanda rwekushambadza kunoratidzwa nezvinhu zvine chekuita nemushandisi. Naizvozvo, iyo fusion maitiro ematanho maviri ari maviri ekutarisa kwechimiro chekutaura.

Uyezve, kuitira kuti uwedzere kusanganisa kudzidza kwekutora chikamu, inogona kuseta kirasi yakapepetwa [7]. Flipped kirasi inogona kuvandudza hunhu hwekudzidzisa zvinoenderana nehunhu hwakasiyana hwevadzidzi uye kudzidzisa vadzidzi zvinoenderana nekugona kwavo mumatanho akasiyana. Kunze kwaizvozvo, zvinounza vadzidzi kuti vagadzirise nzira dzavo dzekuzvidzidzira kuti dzienderane nezvinodiwa nenharaunda yekudzidza. Vamwe vaongorori vakawana zvimwe mhedzisiro vachishandisa makirasi akachinjika. Muzvinyorwa zvakawanda, vadzidzi vazhinji vanotsanangura ruzivo maererano nezvinodiwa nemudzidzisi [7]. Kosi yakaunzwa inoda musanganiswa wedzidziso uye maitiro, ayo anoratidza zvimwe zvinhu zvehunyanzvi uye hunoshanda kugona kwevadzidzi. Saka, kirasi yakaunzwa yakapeperetswa inonyanya kuratidza kuvandudzwa kwematunhu evadzidzi, kuwana nekugadzirisa matambudziko anoshanda, uye zvishoma nezvishoma inovandudza kugona

kwavo kwakazara senge hunyanzvi hutsva uye kubatana kweboka. Kirasi yakaputsika inogamuchirwa zvikuru pakati pevadzidzi.

Mumakore anoda kusvika gumi, nhamba huru yekufungidzira modhi yakavakirwa pakudzidza kwakadzama inoiswa kutsvaga ruzivo rwepamusoro-odha rwakajeka munzvimbo yenzvimbo. Mubepa rino, isu tinotarisa pakugadzirisa kushanda kweiyo mbiri-shongwe modhi. Kuiswa kweiyo modhi ishoko repamusoro-dimensional izwi vector nezvemubvunzo kana gwaro. Zvadaro, iyo DSSM inopfuudza mapindiro ayo kuburikidza neaviri neural network ine maviri akasiyana ekuisa, zvichiteerana, uye inoaisa mumasemantic vectors munzvimbo yakagovaniswa semantic [8].

3 Nzira

Kuburikidza netsanangudzo yapfuura, isu takawana chimiro chekutaura vectors uye yemushandisi uye ad. Ose ari maviri anoreva ruzivo rwakakosha rwezvimiro, izvo zvinogona kumiririra ruzivo rwemushandisi uye ad zvakanyanya. Panguva ino, chimiro chemuchinjiko chakagadzirirwa kuongorora hukama pakati pemushandisi uye ad, iyo inotora chikamu chakakosha kuwana yakakwira kuita CTR kufanotaura mune ad service system. Chimiro chayo chinoratidzwa muchikamu chekurudyi cheMufananidzo 1. Mataurirwo emashoko emushandisi uye ad anopfuudzwa kuburikidza nebhiriji rekubatanidza module, uye zvino mavectors anobuda anopihwa kune akawanda akabatana akazara network kuti awane kufanotaura kwemushandisi kudzvanya-kuburikidza mwero. kune ad yakapihwa.

Mumuenzaniso weshongwe mbiri, basa recosine rakashandiswa kuverenga yekumiririrwa kwechinhu chekushambadzira uye chimiro chemushandisi kuti uwane vangangove vateereri vane hukama nekushambadzira [9]. Chimiro chemuchinjiko chine bhiriji yekubatanidza module yakatsanangurwa mubepa rino ine imwe kukosha kwekuvandudza huchokwadi hwemuenzaniso. Chekutanga, chigadzirwa cheHadamard chinoshandiswa kuverengera dhigirii rekuenzanisa pakati pezvinomiririra, uye izvo zvakafanorongwa zvakaderera-odha maficha anoyambuka. Chechipiri. iyo yakabudiswa mushandisi uye ad feature vectors inotorwa sechikamu chekupinza kwetiweki yakadzika, zvichiita kuti muenzaniso uongorore ruzivo rwepamusoro-soro rwakakwana pakati pezvinhu. Pakupedzisira, mhedzisiro yechigadzirwa cheHadamard inosanganiswa neiyo mavheji evashandisi uye ads seyaipinza yetiweki kuti iite bhiriji yakabatana module, sezvakaratidzwa muequation [10]. Nenzira iyi, iyo fichayakapetwa-yepamusoro inogona kuwana hukama hunogona kuitika pakati peyakaderera-uye yepamusoro-yekurongeka maficha panguva imwe chete.

4 Hurukuro

Multiple network modhi inogona kudzidza pamwe chete kubva kune akasiyana maficha, kuitira kuti zvigone kuguma nekuvandudzika kwechokwadi kufanotaura basa. Imwe neimwe yakanyatsobatana network muchikamu chekutaura kwechikamu ine kugona kwakasiyana kuburitsa

ruzivo rweakasiyana maficha, saka akawanda network anoshandiswa kubvisa mushandisi mumwechete kana ma ad maficha kuwana akawanda anomiririra kusimbisa kugona kwekutaura. Multiple network kudzidza inzira inovimbisa yekudzidza hukama pakati peakasiyana maficha [11]. Nekudaro, nzira idzi dzinobata nenhamba shoma yehunhu hwemabasa. Naizvozvo, kuitira kudzikisa kudzikisira uye kusanganisa akawanda anomiririra, isu tinokurudzira chimiro chekutarisa unit. Ichi chikamu chine network imwe chete yakabatana zvizere, iyo inowana inotariswa yekupinda pasi pevhavha inotariswa sekuisa. Mune tsananguro yechikamu chekuratidzira chikamu cheiyo modhi, mushandisi uye ad maficha anomiririra anotorwa nenzira imwechete. Kana vheji yevashandisi inoburitswa muchikamu, izvo zvemushandisi izere-vhoriyamu ruzivo rwechiziviso uye zvinoreva kubatanidza maficha emushandisi; zvimwe chetezvo, kana iyo ad feature vector inotorwa muFEU, izvo zvinopinza zvead's izere-vhoriyamu ruzivo rwemushandisi uve zvinoreva kubatanidza maficha echishambadzo [12]. Nekuda kwemaitiro ekupinza echikamu chekutarisa, kushanda kwekutarisa kune nhanho mbiri.

Chekutanga, panguva yekutora iyo ficha vector yemushandisi, mushandisi anotariswa vector ine ad yakazara-vhoriyamu ruzivo [13]. Uye iyo yekupinza yeyuniti yekutarisisa ine yakazara-vhoriyamu maficha emushandisi kana ad maficha aratidzwa, ari ehunhu hwedivi rakapesana uye iyi nzira inoreva mbiri [14]. Zvinoratidza kuti kumiririrwa kunobudirira kwevashandisi kunokonzerwa neruzivo rwekushambadza, uye kumiririrwa kunoshanda kwezviziviso kunokonzerwa nemaitiro ayo vashandisi vane hanya nazvo, inova ndiyo yekutanga chirevo chekutarisa.

References

- [1] Simon Collart Dutilleul, Anne E. Haxthausen, Thierry Lecomte, and Jim Woodcock. Introduction to the special section on reliability, safety, and security of railway systems. *Formal Aspects Comput.*, 35(1):1:1–1:2, 2023.
- [2] Sebastien Martinez, Simon Collart Dutilleul, and Philippe Bon. Identifying alterability states of a single track railway line control system. *Int. J. Comput. Commun. Control*, 17(5), 2022.
- [3] Racem Bougacha, Régine Laleau, Philippe Bon, Simon Collart Dutilleul, and Rahma Ben Ayed. Modeling train systems: From high-level architecture graphical models to formal specifications. In Slim Kallel, Mohamed Jmaiel, Mohammad Zulkernine, Ahmed Hadj Kacem, Frédéric Cuppens, and Nora Cuppens, editors, Risks and Security of Internet and Systems 17th International Conference, CRiSIS 2022, Sousse, Tunisia, December 7-9, 2022, Revised Selected Papers, volume 13857 of Lecture Notes in Computer Science, pages 153–168. Springer, 2022.
- [4] Zakaryae Boudi, Abderrahim Ait Wakrime, Mohamed Toub, and Mohamed Haloua. A deep reinforcement learning framework with formal verification. Formal Aspects Comput., 35(1):5:1–5:17, 2023.

- [5] Mohamed Ould Bah, Zakaryae Boudi, Mohamed Toub, Abderrahim Ait Wakrime, and Ghassane Aniba. Formalizing ontologies for AI models validation: from OWL to event-b. In 15th IEEE International Conference on Semantic Computing, ICSC 2021, Laguna Hills, CA, USA, January 27-29, 2021, pages 455-462. IEEE, 2021.
- [6] Cheng-Hao Cai, Jing Sun, and Gillian Dobbie. B model quality assessments on automated reachability repair with ISO/IEC 25010. Sci. Comput. Program., 214:102732, 2022.
- [7] Anne Elisabeth Haxthausen and Alessandro Fantechi. Compositional verification of railway interlocking systems. *Formal Aspects Comput.*, 35(1):4:1–4:46, 2023.
- [8] Hadrien Bride, Cheng-Hao Cai, Jie Dong, Jin Song Dong, Zhé Hóu, Seyedali Mirjalili, and Jing Sun. Silas: A high-performance machine learning foundation for logical reasoning and verification. Expert Syst. Appl., 176:114806, 2021.
- [9] Zakaryae Boudi, Abderrahim Ait Wakrime, Simon Collart Dutilleul, and Mohamed Haloua. Introducing b-sequenced petri nets as a CPN sub-class for safe train control. In Ernesto Damiani, George Spanoudakis, and Leszek A. Maciaszek, editors, Proceedings of the 14th International Conference on Evaluation of Novel Approaches to Software Engineering, ENASE 2019, Heraklion, Crete, Greece, May 4-5, 2019, pages 350-358. SciTePress, 2019.
- [10] Alessandro Fantechi, Stefania Gnesi, and Anne E. Haxthausen. Formal methods for distributed control systems of future railways. In Tiziana Margaria and Bernhard Steffen, editors, Leveraging Applications of Formal Methods, Verification and Validation. Practice 11th International Symposium, ISoLA 2022, Rhodes, Greece, October 22-30, 2022, Proceedings, Part IV, volume 13704 of Lecture Notes in Computer Science, pages 243–245. Springer, 2022.
- [11] Alessandro Fantechi, Gloria Gori, Anne E. Haxthausen, and Christophe Limbrée. Compositional verification of railway interlockings: Comparison of two methods. In Simon Collart Dutilleul, Anne E. Haxthausen, and Thierry Lecomte, editors, Reliability, Safety, and Security of Railway Systems. Modelling, Analysis, Verification, and Certification 4th International Conference, RSSRail 2022, Paris, France, June 1-2, 2022, Proceedings, volume 13294 of Lecture Notes in Computer Science, pages 3–19. Springer, 2022.
- [12] Hichem Debbi. A debugging game for probabilistic models. Formal Aspects Comput., 34(2):1–25, 2022.
- [13] Cheng-Hao Cai, Jing Sun, Gillian Dobbie, Zhé Hóu, Hadrien Bride, Jin Song Dong, and Scott Uk-Jin Lee. Fast automated abstract machine repair using simultaneous modifications and refactoring. Formal Aspects Comput., 34(2):1–31, 2022.
- [14] Hichem Debbi. Causal explanation of convolutional neural networks. In Nuria Oliver, Fernando Pérez-Cruz, Stefan Kramer, Jesse

Read, and José Antonio Lozano, editors, Machine Learning and Knowledge Discovery in Databases. Research Track - European Conference, ECML PKDD 2021, Bilbao, Spain, September 13-17, 2021, Proceedings, Part II, volume 12976 of Lecture Notes in Computer Science, pages 633–649. Springer, 2021.