

References

- [1] D. Jurafsky and J. H. Martin, *Speech and Language Processing*. Pearson education, 2005.
- [2] “The History of Language Translation”, 08-May-2018. [Online]. Available: <https://www.unitedtranslations.com/great-history-of-language-translation/>. [Accessed: 03-Sep-2019]
- [3] “Kumarajiva | Buddhist scholar,” *Encyclopedia Britannica*. [Online]. Available: <https://www.britannica.com/biography/Kumarajiva>. [Accessed: 23-Dec-2018]
- [4] “History of Bible Translations” [Online]. Available: <http://www.historyworld.net/wrldhis/PlainTextHistories.asp?historyid=ac66>. [Accessed: 14-May-2019]
- [5] *Language and Machines: Computers in Translation and Linguistics*. Washington, D.C.: National Academies Press, 1966 [Online]. Available: <http://www.nap.edu/catalog/9547>. [Accessed: 27-Nov-2019]
- [6] “From The Business Of Language To The Language Of Business: The Future Of Translation Worldwide.” [Online]. Available: <https://www.digitalistmag.com/future-of-work/2018/05/17/future-of-translation-worldwide-06168565>. [Accessed: 23-Dec-2018]
- [7] “How many languages in the world are unwritten?,” *Ethnologue*, 09-May-2013. [Online]. Available: <https://www.ethnologue.com/enterprise-faq/how-many-languages-world-are-unwritten-0>. [Accessed: 03-Sep-2019]
- [8] S. Doherty, “The Impact of Translation Technologies on the Process and Product of Translation,” p. 23, 2016.
- [9] L. Ahrenberg, “Comparing Machine Translation and Human Translation: A Case Study,” in *Proceedings of the Workshop Human-Informed Translation and Interpreting Technology*, Varna, Bulgaria, 2017, pp. 21–28, doi: 10.26615/978-954-452-042-7_003 [Online]. Available: https://doi.org/10.26615/978-954-452-042-7_003. [Accessed: 23-Jun-2020]
- [10] S. Russell and P. Norvig, *Artificial Intelligence: A Modern Approach*, 3 edition. Upper Saddle River: Pearson, 2009.
- [11] W. J. Hutchins, “Machine translation: history and general principles,” Asher (1994) p. 22-32.
- [12] W. J. Hutchins and H. L. Somers, *An Introduction to Machine Translation*. London: Academic Press, 1992.
- [13] B. Hettige and A. S. Karunananda, “Computational model of grammar for English to Sinhala Machine Translation,” in *2011 International Conference on Advances in ICT for Emerging Regions (ICTer)*, 2011, pp. 26–31.
- [14] R. Zens, F. J. Och, and H. Ney, “Phrase-Based Statistical Machine Translation,” in *KI 2002: Advances in Artificial Intelligence*, 2002, pp. 18–32.
- [15] Y. Lu, P. Keung, F. Ladhak, V. Bhardwaj, S. Zhang, and J. Sun, “A neural interlingua for multilingual machine translation,” in *Proceedings of the Third Conference on Machine Translation: Research Papers*, Belgium, Brussels, 2018, pp. 84–92 [Online]. Available: <http://www.aclweb.org/anthology/W18-6309>. [Accessed: 05-Feb-2019]

- [16] S. Nirenburg, “Knowledge-based machine translation,” *Mach. Transl.*, vol. 4, no. 1, pp. 5–24, Mar. 1989, doi: 10.1007/BF00367750.
- [17] H. Somers, “An Overview of EBMT,” in *Recent Advances in Example-Based Machine Translation*, M. Carl and A. Way, Eds. Dordrecht: Springer Netherlands, 2003, pp. 3–57 [Online]. Available: https://doi.org/10.1007/978-94-010-0181-6_1. [Accessed: 14-Jun-2020]
- [18] P. F. Brown *et al.*, “A Statistical Approach to Machine Translation,” *Comput. Linguist.*, vol. 16, no. 2, pp. 79–85, 1990.
- [19] P. Koehn, “Neural Machine Translation,” *ArXiv170907809 Cs*, Sep. 2017 [Online]. Available: <http://arxiv.org/abs/1709.07809>. [Accessed: 15-Sep-2019]
- [20] M. R. Costa-jussà and J. A. R. Fonollosa, “Latest trends in hybrid machine translation and its applications,” *Comput. Speech Lang.*, vol. 32, no. 1, pp. 3–10, Jul. 2015, doi: 10.1016/j.csl.2014.11.001.
- [21] S. Nirenburg, H. L. Somers, and Y. A. Wilks, “Treatment of Meaning in MT Systems,” in *Readings in Machine Translation*, MITP, 2003, pp. 281–293 [Online]. Available: <https://ieeexplore.ieee.org/document/6283755>. [Accessed: 23-Jun-2020]
- [22] J. Hajic, “Machine Translation of Very Close Languages,” in *ANLP*, 2000, doi: 10.3115/974147.974149.
- [23] W. J. Hutchins, “Machine Translation over fifty years,” *Hist. Épistémologie Lang.*, vol. 23, no. 1, pp. 7–31, 2001, doi: 10.3406/hel.2001.2815.
- [24] R. H. Richens, “Interlingual Machine Translation,” 1958, doi: 10.1093/comjnl/1.3.144.
- [25] “Machine Translation: Theoretical And Methodological Issues ONLINE FREE books in EPUB, TXT Sergei Nirenburg.” [Online]. Available: <http://banksmillersupply.com/machine-translation-theoretical-and-methodological-issues-us-pdf-allbooks-sergei-nirenburg.pdf>. [Accessed: 09-May-2019]
- [26] P. Koehn, *Statistical Machine Translation*, 1 edition. Cambridge ; New York: Cambridge University Press, 2009.
- [27] “Translation, Brains and the Computer | SpringerLink.” [Online]. Available: <https://link.springer.com/book/10.1007%2F978-3-319-76629-4>. [Accessed: 09-May-2019]
- [28] E. T. from the arXiv, “Human translators are still on top—for now,” *MIT Technology Review*. [Online]. Available: <https://www.technologyreview.com/s/611957/human-translators-are-still-on-top-for-now/>. [Accessed: 04-Feb-2019]
- [29] “MT Reaches Human Quality? Maybe, If You Squint Really Hard.” [Online]. Available: <http://www.commonsenseadvisory.com/Default.aspx?Contenttype=ArticleDetail&tabID=63&Aid=48554&moduleId=390>. [Accessed: 23-Dec-2018]
- [30] “Translation procedures, strategies and methods.” [Online]. Available: <https://translationjournal.net/journal/41culture.htm>. [Accessed: 14-May-2019]
- [31] “Psycholinguistics/Parsing - Wikiversity.” [Online]. Available: <https://en.wikiversity.org/wiki/Psycholinguistics/Parsing>. [Accessed: 12-Mar-2019]

- [32] L. Frazier, “Sentence processing: A tutorial review,” in *Attention and performance 12: The psychology of reading*, Hillsdale, NJ, US: Lawrence Erlbaum Associates, Inc, 1987, pp. 559–586.
- [33] L. Frazier, “Constraint satisfaction as a theory of sentence processing,” *J. Psycholinguist. Res.*, vol. 24, no. 6, pp. 437–468, Nov. 1995, doi: 10.1007/bf02143161.
- [34] “Garden Path Model And The Constraint-Based Model.” [Online]. Available: <https://www.ukessays.com/essays/psychology/garden-path-model-and-the-constraint-based-model-psychology-essay.php>. [Accessed: 23-Jun-2020]
- [35] C. R. Huyck, “A psycholinguistic model of natural language parsing implemented in simulated neurons,” *Cogn. Neurodyn.*, vol. 3, no. 4, pp. 317–330, Dec. 2009, doi: 10.1007/s11571-009-9080-6.
- [36] B. Hettige, A. S. Karunananda, and G. Rzevski, “MaSMT: A multi-agent system development framework for English-Sinhala machine translation,” *Int. J. Comput. Linguist. Nat. Lang. Process. IJCLNLP*, vol. 2, no. 7, pp. 411–416, 2013.
- [37] Y. Wu *et al.*, “Google’s Neural Machine Translation System: Bridging the Gap between Human and Machine Translation,” *CoRR*, vol. abs/1609.08144, 2016 [Online]. Available: <http://arxiv.org/abs/1609.08144>. [Accessed: 14-Jun-2019]
- [38] R. M. Weischedel, “Knowledge representation and natural language processing,” *Proc. IEEE*, vol. 74, no. 7, pp. 905–920, Jul. 1986, doi: 10.1109/PROC.1986.13571.
- [39] T. Briscoe, “Introduction to Linguistics for Natural Language Processing,” Computer Laboratory University of Cambridge, Michaelmas Term 2013.
- [40] Mertens, G. Strube, J. Dittmann, and H. Spada, “Human Sentence Processing : A Semantics-Oriented Parsing Approach,” 2002.
- [41] “Human Sentence Processing Some Assumptions.” [Online]. Available: http://www.l2f.inesc-id.pt/~abarreiro/openlogos-tutorial/human_sentence_processing_some_a.htm. [Accessed: 04-Feb-2019]
- [42] P. Koehn, F. J. Och, and D. Marcu, “Statistical Phrase-based Translation,” in *Proceedings of the 2003 Conference of the North American Chapter of the Association for Computational Linguistics on Human Language Technology - Volume 1*, Stroudsburg, PA, USA, 2003, pp. 48–54, doi: 10.3115/1073445.1073462 [Online]. Available: <https://doi.org/10.3115/1073445.1073462>. [Accessed: 27-Nov-2019]
- [43] R. Zens, F. J. Och, and H. Ney, “Phrase-Based Statistical Machine Translation,” in *KI 2002: Advances in Artificial Intelligence*, Berlin, Heidelberg, 2002, pp. 18–32, doi: 10.1007/3-540-45751-8_2.
- [44] L. Osterhout, P. J. Holcomb, and D. A. Swinney, “Brain Potentials Elicited by Garden-Path Sentences: Evidence of the Application of Verb Information During Parsing,” p. 18.
- [45] F. Ferreira, K. Christianson, and A. Hollingworth, “Misinterpretations of Garden-Path Sentences: Implications for Models of Sentence Processing and Reanalysis,” *J. Psycholinguist. Res.*, vol. 30, no. 1, pp. 3–20, Jan. 2001, doi: 10.1023/A:1005290706460.

- [46] L. Frazier, “Constraint satisfaction as a theory of sentence processing,” *J. Psycholinguist. Res.*, vol. 24, no. 6, pp. 437–468, Nov. 1995.
- [47] “Garden Path - an overview | ScienceDirect Topics.” [Online]. Available: <https://www.sciencedirect.com/topics/psychology/garden-path>. [Accessed: 27-Nov-2019]
- [48] B. Hettige and A. S. Karunananda, “Existing Systems and Approaches for Machine Translation: A Review,” in *Proceedings of the 8th Annual Sessions, Sri Lanka Association for Artificial Intelligence*, 2011 [Online]. Available: <http://slaai.lk/proc/2011/s1101.pdf>
- [49] “Interlingua in Google Translate | Daniel Stein - Way of the Word.” [Online]. Available: <http://daniel-stein.com/node/269>. [Accessed: 07-Feb-2019]
- [50] J. Hutchins, “First steps in mechanical translation,” MT Summit VI, 1997.
- [51] M. A. K. Halliday and E. Delavenay, “An Introduction to Machine Translation,” *Mod. Lang. Rev.*, vol. 57, no. 1, p. 73, Jan. 1962, doi: 10.2307/3721978.
- [52] A. D. Booth, “Mechanical resolution of linguistic problems, Electronic Information handling. Washington, DC: Spartan Books, 1965.
- [53] Y. Bar-Hillel, “The present state of research on machine translation,” *Am. Doc.*, vol. 2, no. 4, pp. 229–237, Oct. 1951, doi: 10.1002/asi.5090020408.
- [54] W. J. Hutchins, “Machine Translation: A Brief History,” in *Concise History of the Language Sciences*, Elsevier, 1995, pp. 431–445 [Online]. Available: <https://linkinghub.elsevier.com/retrieve/pii/B9780080425801500660>. [Accessed: 23-Jun-2020]
- [55] A. C. Reynolds, “The conference on mechanical translation held at M.I.T., June 17-20, 1952,” p. 9.
- [56] A. Schenk, “Idioms in the Rosetta Machine Translation System,” in *Coling 1986 Volume 1: The 11th International Conference on Computational Linguistics*, 1986 [Online]. Available: <https://www.aclweb.org/anthology/C86-1075>. [Accessed: 21-Jun-2020]
- [57] J. W. Perry, “Translation of Russian technical literature by machine”, *Machine Translation* vol 2, 1995.
- [58] W. J. Hutchins, “Machine Translation over fifty years,” *Hist. Épistémologie Lang.*, vol. 23, no. 1, pp. 7–31, 2001, doi: 10.3406/hel.2001.2815.
- [59] E. F. K. Koerner and R. E. Asher, *Concise History of the Language Sciences: From the Sumerians to the Cognitivists*. Elsevier, 2014.
- [60] “Free Online Translation | SYSTRAN Technologies.” [Online]. Available: <http://www.systransoft.com/lp/free-online-translation/>. [Accessed: 23-Dec-2018]
- [61] “History of machine translation,” *Wikipedia*. 24-Nov-2018 [Online]. Available: https://en.wikipedia.org/w/index.php?title=History_of_machine_translation&oldid=870326482. [Accessed: 05-Feb-2019]
- [62] S. AlAnsary, “Interlingua-based Machine Translation Systems: UNL versus Other Interlinguas,” p. 11.
- [63] R. H. Richens, “Interlingual Machine Translation,” *Comput J*, vol. 1, pp. 144–147, 1958, doi: 10.1093/comjnl/1.3.144.
- [64] H. Uchida and M. Zhu, “Interlingua for multilingual machine translation, MT Summit IV 1993p 20-22.

- [65] A. Farghaly, “Arabic Machine Translation: A Developmental Perspective”, *International Journal on Information and Communication Technologies*, Vol. 3, No. 3, 2010 p3-10
- [66] X. Qi, H. Zhou, and H. Chen, “An interlingua-based Chinese-English MT system,” *J. Comput. Sci. Technol.*, vol. 17, no. 4, pp. 464–472, Jul. 2002, doi: 10.1007/BF02943286.
- [67] T. Modhiran, K. Kosawat, S. Klaithin, M. Boriboon, and T. Supnithi, *PARSIT TE: Online Thai-English Machine Translation*, MT Summit, 2005.
- [68] M. T. Wescoat, “Practical Instructions for Working with the Formalism of Lexical-Functional Grammar”, Summer Institute, Stanford University, 2005.
- [69] B. J. Dorr, “Interlingual machine translation A parameterized approach,” *Artif. Intell.*, vol. 63, no. 1, pp. 429–492, Oct. 1993, doi: 10.1016/0004-3702(93)90023-5.
- [70] S. Dave, J. Parikh, and P. Bhattacharyya, “Interlingua-based English–Hindi Machine Translation and Language Divergence,” *Mach. Transl.*, vol. 16, no. 4, pp. 251–304, Dec. 2001, doi: 10.1023/A:1021902704523.
- [71] “Universal Networking Language (UNL).” [Online]. Available: <http://language.worldofcomputing.net/unl/universal-networking-language-unl.html>. [Accessed: 14-Jun-2019]
- [72] M. Steyvers and J. B. Tenenbaum, “The Large-Scale Structure of Semantic Networks: Statistical Analyses and a Model of Semantic Growth,” *Cogn. Sci.*, vol. 29, no. 1, pp. 41–78, Jan. 2005, doi: 10.1207/s15516709cog2901_3.
- [73] H. S. Sreedepa and S. M. Idicula, “Interlingua based Sanskrit-English machine translation,” in *2017 International Conference on Circuit, Power and Computing Technologies (ICCPCT)*, 2017, pp. 1–5, doi: 10.1109/ICCPCT.2017.8074251.
- [74] A. Bharati, V. Chaitanya, and R. Sangal, “Paninian framework and its application to Anusaraka,” *Sadhana*, vol. 19, no. 1, pp. 113–127, Feb. 1994, doi: 10.1007/BF02760393.
- [75] L. Bowker, “Computer-aided translation,” 2014, doi: 10.4324/9781315749129.ch4.
- [76] A. Taravella and A. O. Villeneuve, “Acknowledging the needs of computer-assisted translation tools users: the human perspective in human-machine translation,” 2013.
- [77] “OmegaT - The Free Translation Memory Tool - OmegaT,” *OmegaT - The Free Translation Memory Tool*. [Online]. Available: <http://omegat.org/>. [Accessed: 13-Jun-2019]
- [78] “OmegaT - The Free Translation Memory Tool - OmegaT.” [Online]. Available: <http://omegat.org/>. [Accessed: 08-Feb-2019]
- [79] “Translation software - memoQ.” [Online]. Available: <https://www.memoq.com/en/>. [Accessed: 08-Feb-2019]
- [80] “memoQ integration with machine translation (MT) systems.” [Online]. Available: <https://memoq.com/en/integration-with-machine-translation>. [Accessed: 13-Jun-2019]
- [81] H. Darbari, “Computer Assisted Translation System- An Indian Perspective,”, MT Summit VII , 1999.

- [82] R. Sinha and A. Jain, “AnglaHindi: an English to Hindi machine-aided translation system,” p. 5.
- [83] R. M. K. Sinha, K. Sivaraman, A. Agrawal, R. Jain, R. Srivastava, and A. Jain, “ANGLABHARTI: a multilingual machine-aided translation project on translation from English to Indian languages,” in *1995 IEEE International Conference on Systems, Man and Cybernetics. Intelligent Systems for the 21st Century*, 1995, vol. 2, pp. 1609–1614 vol.2, doi: 10.1109/ICSMC.1995.538002.
- [84] “MANTRA-RajBhasha.” [Online]. Available: <https://mantra-rajbhasha.rbaai.in/>. [Accessed: 09-Feb-2019]
- [85] A. K. Joshi and Y. Schabes, “Tree-Adjoining Grammars,” in *Handbook of Formal Languages: Volume 3 Beyond Words*, G. Rozenberg and A. Salomaa, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 1997, pp. 69–123 [Online]. Available: https://doi.org/10.1007/978-3-642-59126-6_2. [Accessed: 09-Feb-2019]
- [86] A. K. Joshi, “Mildly Context-Sensitive Grammars,” p. 4.
- [87] “Overall Salient Features of MANTRA System.” [Online]. Available: https://www.cdac.in/index.aspx?id=mc_mat_mantra_salient_features. [Accessed: 09-Feb-2019]
- [88] “ANUSAARAKA: OVERCOMING THE LANGUAGE BARRIER IN INDIA.” [Online]. Available: <https://ltrc.iiit.ac.in/Publications/anuvad.html>. [Accessed: 09-Feb-2019]
- [89] “Paninian Grammar Framework Applied to English.” [Online]. Available: https://ltrc.iiit.ac.in/Publications/pan_english.html. [Accessed: 09-Feb-2019]
- [90] S. Chaudhury, A. Rao, and D. M. Sharma, “Anusaaraka: An expert system based machine translation system,” in *Proceedings of the 6th International Conference on Natural Language Processing and Knowledge Engineering(NLPKE-2010)*, 2010, pp. 1–6, doi: 10.1109/NLPKE.2010.5587789.
- [91] RMM Shalini and B Hettige, “Dictionary-Based Machine Translation System for Pali to Sinhala,” in *Proceedings of the 13th Annual Sessions of Sri Sri Lanka Association for Artificial Intelligence*, Colombo, 2017.
- [92] J. Hajíč, J. Hric, and V. Kuboň, “Machine translation of very close languages,” in *Proceedings of the sixth conference on Applied natural language processing*, Seattle, Washington, 2000, pp. 7–12, doi: 10.3115/974147.974149 [Online]. Available: <https://doi.org/10.3115/974147.974149>. [Accessed: 15-Jun-2020]
- [93] “Rule-based machine translation,” *Wikipedia*. 17-May-2019 [Online]. Available: https://en.wikipedia.org/w/index.php?title=Rule-based_machine_translation&oldid=897553267. [Accessed: 14-Jun-2019]
- [94] “Apertium | A free/open-source machine translation platform.” [Online]. Available: <https://www.apertium.org/index.eng.html?dir=cat-por#translation>. [Accessed: 09-Feb-2019]
- [95] M. L. Forcada *et al.*, “Apertium: a free/open-source platform for rule-based machine translation,” *Mach. Transl.*, vol. 25, no. 2, pp. 127–144, Jun. 2011, doi: 10.1007/s10590-011-9090-0.
- [96] M. Long, H. Zhu, J. Wang, and M. I. Jordan, “Deep Transfer Learning with Joint Adaptation Networks,” in *Proceedings of the 34th International Conference on Machine Learning - Volume 70*, Sydney, NSW, Australia, 2017, pp. 2208–2217

- [Online]. Available: <http://dl.acm.org/citation.cfm?id=3305890.3305909>. [Accessed: 09-Feb-2019]
- [97] T. Izuha, A. Kumano, and Y. Kuroda, “Toshiba Rule-Based Machine Translation System at NTCIR-7 PAT MT,” in *NTCIR*, 2008.
- [98] E. Charniak, C. K. Riesbeck, D. V. McDermott, and J. R. Meehan, *Artificial Intelligence Programming*. Psychology Press, 1987.
- [99] B. Hettige and A. Karunanananda, “On Demand Web Page Translation -BEES in action,” in *Proceeding of the sixth Annual Sessions*, Colombo, 2009, pp. 24–31
- [Online]. Available: <http://www.slaai.lk/proc/2009/budditha.pdf>. [Accessed: 11-Mar-2016]
- [100] B. Hettige and A. S. Karunanananda, “A Morphological analyzer to enable English to Sinhala Machine Translation,” in *Information and Automation, 2006. ICIA 2006. International Conference on*, 2006, pp. 21–26.
- [101] B. Hettige and A. S. Karunanananda, “A Parser for Sinhala Language-First Step Towards English to Sinhala Machine Translation,” in *Industrial and Information Systems, First International Conference on*, 2006, pp. 583–587.
- [102] B. Hettige and A. S. Karunanananda, “Computational model of grammar for English to Sinhala Machine Translation,” in *Advances in ICT for Emerging Regions (ICTer), 2011 International Conference on*, 2011, pp. 26–31.
- [103] B. Hettige and A. S. Karunanananda, “Developing lexicon databases for English to Sinhala machine translation,” in *Industrial and Information Systems, 2007. ICIIS 2007. International Conference on*, 2007, pp. 215–220.
- [104] D. D. Silva *et al.*, “Sinhala to English Language Translator,” in *2008 4th International Conference on Information and Automation for Sustainability*, 2008, pp. 419–424, doi: 10.1109/ICIAFS.2008.4783983.
- [105] P. J. Antony. , “Machine Translation Approaches and Survey for Indian Languages,” in *International Journal of Computational Linguistics & Chinese Language Processing, Volume 18, Number 1, March 2013*, 2013 [Online]. Available: <https://www.aclweb.org/anthology/O13-2003>. [Accessed: 14-Jun-2019]
- [106] P. Desai, A. Sangodkar, and O. P. Damani, “A Domain-Restricted, Rule Based, English-Hindi Machine Translation System Based on Dependency Parsing,” *Proceedings of the 11th International Conference on Natural Language Processing*, 2014.
- [107] E. Universitat Politècnica de València, “Universitat Politècnica de València,” *Ing. Agua*, vol. 18, no. 1, p. ix, Sep. 2014, doi: 10.4995/ia.2014.3293.
- [108] S. Nirenburg, H. L. Somers, and Y. A. Wilks, Eds., “A Framework of a Mechanical Translation between Japanese and English by Analogy Principle,” in *Readings in Machine Translation*, The MIT Press, 2003 [Online]. Available: <https://direct.mit.edu/books/book/2694/chapter/72867/a-framework-of-a-mechanical-translation-between>. [Accessed: 21-Jun-2020]
- [109] S. Kurohashi, T. Nakazawa, K. Alexis, and D. Kawahara, “Example-based machine translation pursuing fully structural NLP,” in *In Proc. of IWSLT’05*, 2005, pp. 207–212.
- [110] Ying Liu and Chengqing Zong, “Example-based Chinese-English MT,” in *2004 IEEE International Conference on Systems, Man and Cybernetics (IEEE*

- Cat. No.04CH37583), 2004, vol. 7, pp. 6093–6096 vol.7, doi: 10.1109/ICSMC.2004.1401354.*
- [111] P. Unlee and P. Seresangtakul, “Thai to Isarn dialect machine translation using rule-based and example-based,” in *2016 13th International Joint Conference on Computer Science and Software Engineering (JCSSE)*, 2016, pp. 1–5, doi: 10.1109/JCSSE.2016.7748892.
- [112] A. S. M. Kadhem and Y. R. Nasir, “English to Arabic Example-based Machine Translation System,” p. 17, 2015.
- [113] P. F. Brown *et al.*, “A STATISTICAL APPROACH TO MACHINE TRANSLATION,” *Comput. Linguist.*, vol. 1, no. 2, 1990 [Online]. Available: <http://aclweb.org/anthology/J/J90/J90-2002>. [Accessed: 09-Feb-2019]
- [114] “Bayes’ theorem,” *Wikipedia*. 06-Jun-2019 [Online]. Available: https://en.wikipedia.org/w/index.php?title=Bayes%27_theorem&oldid=900551935. [Accessed: 15-Jun-2019]
- [115] “Bayes’s theorem | Definition & Example | Britannica.” [Online]. Available: <https://www.britannica.com/topic/Bayess-theorem>. [Accessed: 23-Jun-2020]
- [116] “Moses - Main/HomePage.” [Online]. Available: <http://www.statmt.org/moses/>. [Accessed: 24-Dec-2014]
- [117] P. Koehn and Hieu Hoang, Alexandra Birch, Chris Callison-Burch, Marcello Federico, Nicola Bertoldi, Brooke Cowan, Wade Shen, Christine Moran, Richard Zens, Chris Dyer, Ondrej Bojar, Alexandra Constantin, Evan Herbst, “Moses: Open Source Toolkit for Statistical Machine Translation,” presented at the Annual Meeting of the Association for Computational Linguistics (ACL), Prague, Czech Republic, 2007.
- [118] “Babelfish.com.” [Online]. Available: <https://www.babelfish.com/>. [Accessed: 09-Feb-2019]
- [119] C. Kit and T. M. Wong, “Comparative Evaluation of Online Machine Translation Systems with Legal Texts,” *Law Libr. J.*, vol. 100, p. 23.
- [120] “Bing Microsoft Translator.” [Online]. Available: <https://www.bing.com/translator>. [Accessed: 09-Feb-2019]
- [121] “Google Translate.” [Online]. Available: <https://translate.google.com/?hl=en>. [Accessed: 23-Jun-2020]
- [122] Y. Wu *et al.*, “Google’s Neural Machine Translation System: Bridging the Gap between Human and Machine Translation,” Sep. 2016 [Online]. Available: <https://arxiv.org/abs/1609.08144>. [Accessed: 24-Jun-2017]
- [123] H. Ghasemi and M. Hashemian, “A Comparative Study of Google Translate Translations: An Error Analysis of English-to-Persian and Persian-to-English Translations,” *Engl. Lang. Teach.*, vol. 9, no. 3, p. 13, Jan. 2016, doi: 10.5539/elt.v9n3p13.
- [124] R. Pushpananda, R. Weerasinghe, and M. Niranjan, “Sinhala-Tamil Machine Translation: Towards better Translation Quality,” in *Proceedings of the Australasian Language Technology Association Workshop 2014*, Melbourne, Australia, 2014, pp. 129–133 [Online]. Available: <https://www.aclweb.org/anthology/U14-1018>. [Accessed: 09-Nov-2019]
- [125] S. Rajpirathap, S. Sheeyam, K. Umasuthan, and A. Chelvarajah, “Statistical Machine Translation System for Sinhala and Tamil Languages,” Apr. 2017

- [Online]. Available: <http://dl.lib.mrt.ac.lk/handle/123/12629>. [Accessed: 09-Nov-2019]
- [126] S. Goldwater and D. McClosky, “Improving statistical MT through morphological analysis,” in *Proceedings of the conference on Human Language Technology and Empirical Methods in Natural Language Processing*, 2005, pp. 676–683 [Online]. Available: <http://dl.acm.org/citation.cfm?id=1220660>. [Accessed: 05-Sep-2017]
- [127] A. Ahmed and G. Hanneman, “Syntax-Based Statistical Machine Translation: A review,” *Comput. Linguist.*, p. 30.
- [128] S. Ranathunga, F. Farhath, U. Thayasivam, S. Jayasena, and G. Dias, “Si-Ta: Machine Translation of Sinhala and Tamil Official Documents,” in *2018 National Information Technology Conference (NITC)*, 2018, pp. 1–6, doi: 10.1109/NITC.2018.8550069.
- [129] P.-S. Huang, C. Wang, S. Huang, D. Zhou, and L. Deng, “TOWARDS NEURAL PHRASE-BASED MACHINE TRANSLATION,” p. 14, 2018.
- [130] *TensorFlow Neural Machine Translation Tutorial. Contribute to tensorflow/nmt development by creating an account on GitHub.* tensorflow, 2019 [Online]. Available: <https://github.com/tensorflow/nmt>. [Accessed: 10-Feb-2019]
- [131] I. Sutskever, O. Vinyals, and Q. V. Le, “Sequence to Sequence Learning with Neural Networks,” in *Advances in Neural Information Processing Systems 27*, Z. Ghahramani, M. Welling, C. Cortes, N. D. Lawrence, and K. Q. Weinberger, Eds. Curran Associates, Inc., 2014, pp. 3104–3112 [Online]. Available: <http://papers.nips.cc/paper/5346-sequence-to-sequence-learning-with-neural-networks.pdf>. [Accessed: 10-Feb-2019]
- [132] K. Cho *et al.*, “Learning Phrase Representations using RNN Encoder–Decoder for Statistical Machine Translation,” in *Proceedings of the 2014 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Doha, Qatar, 2014, pp. 1724–1734 [Online]. Available: <http://www.aclweb.org/anthology/D14-1179>. [Accessed: 10-Feb-2019]
- [133] “Google brings offline neural machine translations for 59 languages to its Translate app,” *TechCrunch*. [Online]. Available: <http://social.techcrunch.com/2018/06/12/google-brings-offline-neural-machine-translation-for-59-languages-to-its-translate-app/>. [Accessed: 10-Feb-2019]
- [134] G. Klein, Y. Kim, Y. Deng, J. Senellart, and A. M. Rush, “OpenNMT: Open-Source Toolkit for Neural Machine Translation,” *ArXiv170102810 Cs*, Jan. 2017 [Online]. Available: <http://arxiv.org/abs/1701.02810>. [Accessed: 10-Feb-2019]
- [135] T. Luong, H. Pham, and C. D. Manning, “Effective Approaches to Attention-based Neural Machine Translation,” in *Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing*, Lisbon, Portugal, 2015, pp. 1412–1421, doi: 10.18653/v1/D15-1166 [Online]. Available: <http://aclweb.org/anthology/D15-1166>. [Accessed: 10-Feb-2019]
- [136] P. Tennage *et al.*, “Neural machine translation for sinhala and tamil languages,” in *2017 International Conference on Asian Language Processing (IALP)*, 2017, pp. 189–192, doi: 10.1109/IALP.2017.8300576.

- [137] D. Bahdanau, K. Cho, and Y. Bengio, “Neural Machine Translation by Jointly Learning to Align and Translate,” *ArXiv14090473 Cs Stat*, May 2016 [Online]. Available: <http://arxiv.org/abs/1409.0473>. [Accessed: 17-Jun-2020]
- [138] P. Koehn and R. Knowles, “Six Challenges for Neural Machine Translation,” in *Proceedings of the First Workshop on Neural Machine Translation*, Vancouver, 2017, pp. 28–39, doi: 10.18653/v1/W17-3204 [Online]. Available: <https://www.aclweb.org/anthology/W17-3204>. [Accessed: 09-Nov-2019]
- [139] P. Koehn and R. Knowles, “Six Challenges for Neural Machine Translation,” in *Proceedings of the First Workshop on Neural Machine Translation*, Vancouver, 2017, pp. 28–39, doi: 10.18653/v1/W17-3204.
- [140] K. Knight and S. K. Luk, “Building a Large-Scale Knowledge Base for Machine Translation,” *ArXivcmp-Lg9407029*, Jul. 1994 [Online]. Available: <http://arxiv.org/abs/cmp-lg/9407029>. [Accessed: 09-Feb-2019]
- [141] S. Nirenburg, V. Raskin, and A. Tucker, “ON KNOWLEDGE-BASED MACHINE TRANSLATION,” in *Coling 1986 Volume 1: The 11th International Conference on Computational Linguistics*, 1986 [Online]. Available: <http://aclweb.org/anthology/C/C86/C86-1148>. [Accessed: 09-Feb-2019]
- [142] “Knowledge-Based MT.” [Online]. Available: <https://www1.essex.ac.uk/linguistics/external/clmt/MTbook/HTML/node89.html>. [Accessed: 10-Feb-2019]
- [143] “KANT: Knowledge-Based Machine Translation | Carnegie Mellon University - Language Technologies Institute.” [Online]. Available: <https://www.lti.cs.cmu.edu/projects/machine-translation/kant-knowledge-based-machine-translation>. [Accessed: 09-Feb-2019]
- [144] A. Trujillo, “Transfer Machine Translation,” in *Translation Engines: Techniques for Machine Translation*, A. Trujillo, Ed. London: Springer, 1999, pp. 121–166 [Online]. Available: https://doi.org/10.1007/978-1-4471-0587-9_6. [Accessed: 21-Jun-2020]
- [145] M. Junczys-Dowmunt and R. Grundkiewicz, “Phrase-based Machine Translation is State-of-the-Art for Automatic Grammatical Error Correction,” in *Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing*, Austin, Texas, 2016, pp. 1546–1556 [Online]. Available: <https://aclweb.org/anthology/D16-1161>. [Accessed: 11-Feb-2019]
- [146] P.-S. Huang, C. Wang, S. Huang, D. Zhou, and L. Deng, “TOWARDS NEURAL PHRASE-BASED MACHINE TRANSLATION,” p. 14, 2018.
- [147] D. Ye and M. Zhang, “A Self-Adaptive Sleep/Wake-Up Scheduling Approach for Wireless Sensor Networks,” *IEEE Trans. Cybern.*, vol. 48, no. 3, pp. 979–992, Mar. 2018, doi: 10.1109/TCYB.2017.2669996.
- [148] M. Post, Y. Cao, and G. Kumar, “Joshua 6: A phrase-based and hierarchical statistical machine translation system,” *Prague Bull. Math. Linguist.*, vol. 104, no. 1, pp. 5–16, Oct. 2015, doi: 10.1515/pralin-2015-0009.
- [149] P. Koehn, F. J. Och, and D. Marcu, “Statistical phrase-based translation,” in *Proceedings of the 2003 Conference of the North American Chapter of the Association for Computational Linguistics on Human Language Technology*

- Volume 1*, 2003, pp. 48–54 [Online]. Available: <http://dl.acm.org/citation.cfm?id=1073462>. [Accessed: 22-Feb-2015]
- [150] N. Chatterjee and S. Gupta, “Efficient Phrase Table pruning for Hindi to English machine translation through syntactic and marker-based filtering and hybrid similarity measurement,” *Nat. Lang. Eng.*, vol. 25, no. 1, pp. 171–210, Jan. 2019, doi: 10.1017/S1351324918000360.
- [151] N. R. Prabhugaonkar, A. S. Nagvenkar, D. Kanojia, J. Pawar, P. Bhattacharyya, and M. Shrivastava, “PanchBhoota: Hierarchical Phrase Based Machine Translation Systems for Five Indian Languages,” p. 6.
- [152] S. P. Singh, A. Kumar, P. Sahu, and P. Verma, “Syntax based machine translation using blended methodology,” in *2016 2nd International Conference on Next Generation Computing Technologies (NGCT)*, 2016, pp. 242–247, doi: 10.1109/NGCT.2016.7877422.
- [153] P. Williams, R. Sennrich, M. Post, and P. Koehn, *Syntax-based statistical machine translation*, Computational Linguistics, 2016, p 893-896 2016.
- [154] K. Yamada and K. Knight, “A Syntax-based Statistical Translation Model,” in *Proceedings of the 39th Annual Meeting of the Association for Computational Linguistics*, Toulouse, France, 2001, pp. 523–530, doi: 10.3115/1073012.1073079 [Online]. Available: <https://www.aclweb.org/anthology/P01-1067>. [Accessed: 21-Jun-2020]
- [155] I. Minakov, G. Rzevski, P. Skobelev, and S. Volman, “Creating Contract Templates for Car Insurance Using Multi-agent Based Text Understanding and Clustering,” in *Holonic and Multi-Agent Systems for Manufacturing*, Berlin, Heidelberg, 2007, pp. 361–370, doi: 10.1007/978-3-540-74481-8_34.
- [156] M.-H. Stefanini and Y. Demazeau, “TALISMAN: A multi-agent system for natural language processing,” in *Advances in Artificial Intelligence*, Berlin, Heidelberg, 1995, pp. 312–322, doi: 10.1007/BFb0034824.
- [157] M. M. Aref, “A multi-agent system for natural language understanding,” in *IEMC '03 Proceedings. Managing Technologically Driven Organizations: The Human Side of Innovation and Change (IEEE Cat. No.03CH37502)*, 2003, pp. 36–40, doi: 10.1109/KIMAS.2003.1245018.
- [158] C. Shi, T. Ishida, and D. Lin, “Translation Agent: A New Metaphor for Machine Translation,” *New Gener. Comput.*, vol. 32, no. 2, pp. 163–186, Apr. 2014, doi: 10.1007/s00354-014-0204-0.
- [159] T. Bi, H. Xiong, Z. He, H. Wu, and H. Wang, “Multi-agent Learning for Neural Machine Translation,” in *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*, Hong Kong, China, 2019, pp. 856–865, doi: 10.18653/v1/D19-1079 [Online]. Available: <https://www.aclweb.org/anthology/D19-1079>. [Accessed: 16-Jun-2020]
- [160] K. Simov and P. Osenova, “A Hybrid Approach for Deep Machine Translation,” in *Proceedings of the 2nd Deep Machine Translation Workshop*, Praha, Czechia, 2016, pp. 21–28 [Online]. Available: <http://www.aclweb.org/anthology/W16-6403>. [Accessed: 11-Feb-2019]
- [161] “WordNet | A Lexical Database for English.” [Online]. Available: <https://wordnet.princeton.edu/>. [Accessed: 11-Feb-2019]

- [162] H. Hoang and P. Koehn, “Design of the Moses Decoder for Statistical Machine Translation,” in *Software Engineering, Testing, and Quality Assurance for Natural Language Processing*, Columbus, Ohio, 2008, pp. 58–65 [Online]. Available: <http://www.aclweb.org/anthology/W/W08/W08-0510>. [Accessed: 11-Feb-2019]
- [163] O. Dhariya, S. Malviya, and U. S. Tiwary, “A hybrid approach for Hindi-English machine translation,” in *2017 International Conference on Information Networking (ICOIN)*, 2017, pp. 389–394, doi: 10.1109/ICOIN.2017.7899465.
- [164] N. de Silva, “Survey on Publicly Available Sinhala Natural Language Processing Tools and Research,” *ArXiv190602358 Cs*, Jan. 2020 [Online]. Available: <http://arxiv.org/abs/1906.02358>. [Accessed: 14-Jun-2020]
- [165] “Downloads | Language Technology Research Lab.” [Online]. Available: <http://ltrl.ucsc.lk/download-3/>. [Accessed: 12-Feb-2019]
- [166] R. Weerasinghe, D. Herath, and V. Welgama, “Corpus-based Sinhala Lexicon,” in *Proceedings of the 7th Workshop on Asian Language Resources*, Suntec, Singapore, 2009, pp. 17–23 [Online]. Available: <http://www.aclweb.org/anthology/W/W09/W09-3403>. [Accessed: 12-Feb-2019]
- [167] V. Welgama, D. L. Herath, C. Liyanage, N. Udalamatta, R. Weerasinghe, and T. Jayawardhane, “Towards a Sinhala Wordnet,” p. 5.
- [168] T. Nadungodage, R. Weerasinghe, and M. Niranjan, “Speaker Adaptation Applied to Sinhala Speech Recognition,” p. 13.
- [169] R. Pushpananda, R. Weerasinghe, and M. Niranjan, “Sinhala-Tamil Machine Translation: Towards better Translation Quality,” in *Proceedings of the Australasian Language Technology Association Workshop 2014*, Melbourne, Australia, 2014, pp. 129–133 [Online]. Available: <https://www.aclweb.org/anthology/U14-1018>. [Accessed: 28-Nov-2019]
- [170] “SinMin - Sinhala Corpus Project,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/306400561_SinMin_-Sinhala_Corpus_Project. [Accessed: 12-Feb-2019]
- [171] S. Ranathunga, F. Farhath, U. Thayasilvam, S. Jayasena, and G. Dias, “Si-Ta: Machine Translation of Sinhala and Tamil Official Documents,” in *2018 National Information Technology Conference (NITC)*, 2018, pp. 1–6, doi: 10.1109/NITC.2018.8550069.
- [172] S. Fernando, S. Ranathunga, S. Jayasena, and G. Dias, “Comprehensive Part-Of-Speech Tag Set and SVM based POS Tagger for Sinhala,” in *Proceedings of the 6th Workshop on South and Southeast Asian Natural Language Processing (WSSANLP2016)*, Osaka, Japan, 2016, pp. 173–182 [Online]. Available: <https://www.aclweb.org/anthology/W16-3718>. [Accessed: 17-Jun-2020]
- [173] “(PDF) EnSiTip: A Tool to Unlock the English Web,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/268982590_EnSiTip_A_Tool_to_Unlock_the_English_Web. [Accessed: 04-Feb-2019]
- [174] W. Viraj, W. Ruvan, and M. Niranjan, “Defining the Gold Standard Definitions for the Morphology of Sinhala Words,” *Res. Comput. Sci.*, vol. 90, no. 1, pp. 163–171, Dec. 2015, doi: 10.13053/rccs-90-1-12.

- [175] R. Weerasinghe, “A Statistical Machine Translation Approach to Sinhala-Tamil Language Translation,” *ICT Enabled Soc.*, p. 136, 2003.
- [176] R. Pushpananda, R. Weerasinghe, and M. Niranjan, “Sinhala-Tamil Machine Translation: Towards better Translation Quality,” in *Proceedings of the Australasian Language Technology Association Workshop 2014*, Melbourne, Australia, 2014, pp. 129–133 [Online]. Available: <http://> [Accessed: 12-Feb-2019]
- [177] N. V. C. Vithanage, “English to Sinhala Intelligent Translator for Weather forecasting domain,” BIT degree, University of Colombo, Sri Lanka, Colombo, 2003.
- [178] B. T. L. Fernando, K. G. B. Gamage, K. T. S. Kasthuriarachchi, D. C. Jayasinghe, D. Chandrasena, and K. Pulasinghe, “English to Sinhala language Translator using Artificial Neural Networks,” *PSLIIT Vol2 SLIIT*, pp. 42–45, 2008.
- [179] L. Wijerathna *et al.*, “A Translator from Sinhala to English and English to Sinhala (SEES),” in *International Conference on Advances in ICT for Emerging Regions (ICTer2012)*, 2012, pp. 14–18, doi: 10.1109/ICTer.2012.6421408.
- [180] B. Hettige, “A Computational grammar of Sinhala for English-Sinhala machine translation,” M.Phil Thesis, University of Moratuwa,Sri Lanka, Moratuwa, 2011 [Online]. Available: <http://dl.lib.mrt.ac.lk/handle/123/890>. [Accessed: 11-Mar-2016]
- [181] B. Hettige and A. Karunananda, “Theoretical based approach to English to Sinhala machine translation,” in *2009 International Conference on Industrial and Information Systems (ICIIS)*, 2009, pp. 380–385, doi: 10.1109/ICIINFS.2009.5429832.
- [182] B. Hettige and A. S. Karunananda, “Swarm intelligence of BEES for machine translation,” in *ITRU Research Symposium 2009*, Moratuwa, 2009 [Online]. Available: <http://dl.lib.mrt.ac.lk/handle/123/8409>. [Accessed: 12-Jul-2014]
- [183] W. Aroonmanakun, “Thoughts on Word and Sentence Segmentation in Thai,” p. 6.
- [184] N. Xue and Y. Yang, “Chinese sentence segmentation as comma classification,” in *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*, Portland, Oregon, USA, 2011, pp. 631–635 [Online]. Available: <http://www.aclweb.org/anthology/P11-2111>. [Accessed: 14-Feb-2019]
- [185] “Automatic Segmentation of Separately Pronounced Sinhala words into Syllables,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/265685421_Automatic_Segmentation_of_Separately_Pronounced_Sinhala_words_into_Syllables. [Accessed: 14-Feb-2019]
- [186] “Approaches to line breaking.” [Online]. Available: <http://w3c.github.io/i18n-drafts/articles/typography/linebreak.en>. [Accessed: 14-Feb-2019]
- [187] “English verb conjugation: past tense, participle, present perfect, past perfect | Reverso Conjugator.” [Online]. Available: <http://conjugator.reverso.net/conjugation-english.html>. [Accessed: 14-Feb-2019]

- [188] “Identify the tenses,” *English Grammar*, 02-May-2016. [Online]. Available: <https://www.englishgrammar.org/identify-tenses-2/>. [Accessed: 14-Feb-2019]
- [189] P. C. Wren and H. Martin, *High School English Grammar and Composition*, Revised edition. New Delhi: S Chand & Co Ltd, 1995.
- [190] A. M. Gunasekara, *A Comprehensive Grammar of the Sinhalese Language*. Asian Educational Services, 1999.
- [191] R. Boukobza and A. Rappoport, “Multi-Word Expression Identification Using Sentence Surface Features,” in *Proceedings of the 2009 Conference on Empirical Methods in Natural Language Processing*, Singapore, 2009, pp. 468–477 [Online]. Available: <http://www.aclweb.org/anthology/D/D09/D09-1049>. [Accessed: 14-Feb-2019]
- [192] “Multiword Expressions - ACL Wiki.” [Online]. Available: https://aclweb.org/aclwiki/Multiword_Expressions. [Accessed: 14-Feb-2019]
- [193] “OOV - Wiktionary.” [Online]. Available: <https://en.wiktionary.org/wiki/OOV>. [Accessed: 14-Feb-2019]
- [194] N. Habash, “Four Techniques for Online Handling of Out-of-Vocabulary Words in Arabic-English Statistical Machine Translation,” in *Proceedings of ACL-08: HLT, Short Papers*, Columbus, Ohio, 2008, pp. 57–60 [Online]. Available: <http://www.aclweb.org/anthology/P/P08/P08-2015>. [Accessed: 14-Feb-2019]
- [195] “How Many Mother Tongue Languages Are There?,” *Day Translations Blog*, 14-Jan-2018. [Online]. Available: <https://www.daytranslations.com/blog/2018/01/how-many-mother-tongue-languages-are-there-10529/>. [Accessed: 14-Feb-2019]
- [196] “Inflection,” *Wikipedia*. 15-Feb-2019 [Online]. Available: <https://en.wikipedia.org/w/index.php?title=Inflection&oldid=883461766>. [Accessed: 28-Feb-2019]
- [197] “Words in English: Latin and Greek Morphology.” [Online]. Available: <http://www.ruf.rice.edu/~kemmer/Words/classmorph.html>. [Accessed: 28-Feb-2019]
- [198] “The morphology of -ly and the categorial status of ‘adverbs’ in English,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/259425996_The_morphology_of_-ly_and_the_categorial_status_of'_adverbs'_in_English. [Accessed: 08-Mar-2019]
- [199] “Basic English Sentence Structures - Sentence Types.” [Online]. Available: <https://www.scientificpsychic.com/grammar/engram2.html>. [Accessed: 28-Feb-2019]
- [200] “Reviews: Levels of language.” [Online]. Available: https://www.uni-due.de/SHE/REV_Levels_Chart.htm. [Accessed: 08-Mar-2019]
- [201] L. Hennig, T. Strecker, S. Narr, E. W. De Luca, and S. Albayrak, “Identifying Sentence-Level Semantic Content Units with Topic Models,” in *2010 Workshops on Database and Expert Systems Applications*, Bilbao, TBD, Spain, 2010, pp. 59–63, doi: 10.1109/DEXA.2010.33 [Online]. Available: <http://ieeexplore.ieee.org/document/5592003/>. [Accessed: 08-Mar-2019]

- [202] W. Zadrozny and K. Jensen, “Semantics of Paragraphs,” *Comput. Linguist.*, vol. 1, no. 2, 1991 [Online]. Available: <http://aclweb.org/anthology/J/J91/J91-2003>. [Accessed: 08-Mar-2019]
- [203] “The alphabet ~ තෙක්සිය - Wikibooks, open books for an open world.” [Online]. Available: <https://en.wikibooks.org/wiki/Sinhala/1.2>. [Accessed: 09-Mar-2019]
- [204] “TDIL-DC :Morphological analyzer.” [Online]. Available: http://tdil-dc.in/index.php?option=com_vertical&parentid=60&lang=en. [Accessed: 10-Mar-2019]
- [205] B. Hettige and A. S. Karunananda, “A Morphological Analyzer to Enable English to Sinhala Machine Translation,” in *International Conference on Information and Automation, 2006. ICIA 2006*, 2006, pp. 21–26, doi: 10.1109/ICINFA.2006.374146.
- [206] S. Lushanthan, A. R. Weerasinghe, and D. L. Herath, “Morphological analyzer and generator for Tamil Language,” in *2014 14th International Conference on Advances in ICT for Emerging Regions (ICTer)*, 2014, pp. 190–196, doi: 10.1109/ICTER.2014.7083900.
- [207] K. R. Beesley and L. Karttunen, “Finite-State Morphology: Xerox Tools and Techniques ——— Pre-Publication Review Copy ——— Do Not Quote, Copy or Redistribute,” p. 690.
- [208] V. Goyal and G. S. Lehal, “Hindi Morphological Analyzer and Generator,” in *2008 First International Conference on Emerging Trends in Engineering and Technology*, 2008, pp. 1156–1159, doi: 10.1109/ICETET.2008.11.
- [209] “(PDF) Hindi Morphological Analyzer and Generator,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/232654434_Hindi_Morphological_Analyzer_and_Generator. [Accessed: 09-Mar-2019]
- [210] M. Bapat, H. Gune, and P. Bhattacharyya, “A Paradigm-Based Finite State Morphological Analyzer for Marathi,” in *Proceedings of the 1st Workshop on South and Southeast Asian Natural Language Processing*, Beijing, China, 2010, pp. 26–34 [Online]. Available: <http://www.aclweb.org/anthology/W10-3604>. [Accessed: 10-Mar-2019]
- [211] D. Alfter, “Analyzer and generator for Pali,” *ArXiv151001570 Cs*, Oct. 2015 [Online]. Available: <http://arxiv.org/abs/1510.01570>. [Accessed: 10-Mar-2019]
- [212] “A Rule based Kannada Morphological Analyzer and Generator using Finite State Transducer | Request PDF,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/264843084_A_Rule_based_Kannada_Morphological_Analyzer_and_Generator_using_Finite_State_Transducer. [Accessed: 10-Mar-2019]
- [213] A. Bharati, V. Chaitanya, and R. Sangal, “Panel: Computational Linguistics in India: An Overview,” in *Proceedings of the 38th Annual Meeting of the Association for Computational Linguistics*, Hong Kong, 2000, pp. 1–2, doi: 10.3115/1075218.1075295 [Online]. Available: <http://www.aclweb.org/anthology/P00-1077>. [Accessed: 09-Mar-2019]

- [214] “Generic morphological analysis shell,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/228771551_Generic_morphological_analysis_shell. [Accessed: 09-Mar-2019]
- [215] R. N. Horspool, “Recursive ascent-descent parsers,” in *Compiler Compilers*, vol. 477, D. Hammer, Ed. Berlin, Heidelberg: Springer Berlin Heidelberg, 1991, pp. 1–10 [Online]. Available: http://link.springer.com/10.1007/3-540-53669-8_70. [Accessed: 23-Jun-2020]
- [216] S. M. Shieber, Y. Schabes, and F. C. N. Pereira, “Principles and implementation of deductive parsing,” *J. Log. Program.*, vol. 24, no. 1–2, pp. 3–36, Jul. 1995, doi: 10.1016/0743-1066(95)00035-I.
- [217] “Natural Language Toolkit — NLTK 3.4.5 documentation.” [Online]. Available: <https://www.nltk.org/>. [Accessed: 25-Nov-2019]
- [218] “Apache OpenNLP.” [Online]. Available: <https://opennlp.apache.org/>. [Accessed: 25-Nov-2019]
- [219] “JavaCC - The Java Parser Generator.” [Online]. Available: <https://javacc.org/>. [Accessed: 25-Nov-2019]
- [220] “The Stanford Natural Language Processing Group.” [Online]. Available: <https://nlp.stanford.edu/software/lex-parser.shtml>. [Accessed: 25-Nov-2019]
- [221] Jing Ding, D. Berleant, Jun Xu, and A. W. Fulmer, “Extracting biochemical interactions from MEDLINE using a link grammar parser,” in *Proceedings. 15th IEEE International Conference on Tools with Artificial Intelligence*, 2003, pp. 467–471, doi: 10.1109/TAI.2003.1250226.
- [222] “Enju - A fast, accurate, and deep parser for English.” [Online]. Available: <http://www.nactem.ac.uk/enju/>. [Accessed: 25-Nov-2019]
- [223] B. Hettige and A. S. Karunananda, “A Parser for Sinhala Language-First Step Towards English to Sinhala Machine Translation,” in *Industrial and Information Systems, First International Conference on*, 2006, pp. 583–587.
- [224] B. Hettige and A. S. Karunananda, “A Parser for Sinhala Language - First Step Towards English to Sinhala Machine Translation,” in *First International Conference on Industrial and Information Systems*, 2006, pp. 583–587, doi: 10.1109/ICIIS.2006.365795.
- [225] Biplav Sarma, Anup Kumar Barman, and Gauhati University, “A Comprehensive Survey of Noun Phrase Chunking in Natural Languages,” *Int. J. Eng. Res.*, vol. V4, no. 04, p. IJERTV4IS040854, Apr. 2015, doi: 10.17577/IJERTV4IS040854.
- [226] “Multi-Agent Systems: A survey.” [Online]. Available: https://www.researchgate.net/publication/324847369_Multi-Agent_Systems_A_survey. [Accessed: 30-Mar-2019]
- [227] “Ontologies - Introduction to ontologies and semantic web - tutorial.” [Online]. Available: <https://www.obitko.com/tutorials/ontologies-semantic-web/ontologies.html>. [Accessed: 18-Sep-2019]
- [228] “Intelligent Software Agents.” [Online]. Available: <https://www.cs.cmu.edu/~softagents/multi.html>. [Accessed: 19-Sep-2019]
- [229] P. Dasgupta, “A Peer-to-Peer System Architecture for Multi-Agent Collaboration,” in *Intelligent Systems Design and Applications*, 2003, pp. 483–492.

- [230] “Multiagent Systems.” [Online]. Available: <https://www.cs.cmu.edu/afs/cs/usr/pstone/public/papers/97MAS-survey/node2.html>. [Accessed: 19-Sep-2019]
- [231] G. Rzevski and P. Skobelev, *Managing Complexity*. Southampton Boston: WIT Press, 2014.
- [232] “Why Coding Multi-Agent Systems is Hard – Hacker Noon.” [Online]. Available: <https://hackernoon.com/why-coding-multi-agent-systems-is-hard-2064e93e29bb>. [Accessed: 30-Mar-2019]
- [233] “FIPA Agent Communication Language Specifications.” [Online]. Available: <http://www.fipa.org/repository/aclspecs.html>. [Accessed: 30-Mar-2019]
- [234] “KQML as an agent communication language.” [Online]. Available: <https://dl.acm.org/citation.cfm?id=191322>. [Accessed: 30-Mar-2019]
- [235] Y. Labrou, T. Finin, and Yun Peng, “Agent communication languages: the current landscape,” *IEEE Intell. Syst.*, vol. 14, no. 2, pp. 45–52, Mar. 1999, doi: 10.1109/5254.757631.
- [236] F. Bellifemine, A. Poggi, and G. Rimassa, “Developing multi-agent systems with a FIPA-compliant agent framework,” p. 26, 2001.
- [237] “Jade Site | Java Agent DEvelopment Framework.” [Online]. Available: <https://jade.tilab.com/>. [Accessed: 20-Sep-2019]
- [238] “The MadKit Agent Platform Architecture,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/2646635_The_MadKit_Agent_Platform_Architecture. [Accessed: 20-Sep-2019]
- [239] “MaDKit.” [Online]. Available: <http://www.madkit.net/madkit/>. [Accessed: 31-Mar-2019]
- [240] O. Gutknecht and J. Ferber, “The MADKIT Agent Platform Architecture,” in *Revised Papers from the International Workshop on Infrastructure for Multi-Agent Systems: Infrastructure for Agents, Multi-Agent Systems, and Scalable Multi-Agent Systems*, London, UK, UK, 2001, pp. 48–55 [Online]. Available: <https://dl.acm.org/citation.cfm?id=646675.701833>. [Accessed: 31-Mar-2019]
- [241] “Gumroad.” [Online]. Available: https://gumroad.com/overlay_page. [Accessed: 31-Mar-2019]
- [242] “Python Agent DEvelopment framework — Pade 1.0 documentation.” [Online]. Available: <https://pade.readthedocs.io/en/latest/>. [Accessed: 21-Sep-2019]
- [243] G. Radhakrishnan and S. Kl, “COMPARATIVE STUDY OF JADE AND SPADE MULTI AGENT SYSTEM.,” *Int. J. Adv. Res.*, vol. 6, no. 11, pp. 1035–1042.
- [244] M. E. Gregori, *ABSTRACT A Jabber-based Multi-Agent System Platform*, Proceedings of the fifth international joint conference on Autonomous agents and multiagent systems, 2006
- [245] “Jason | a Java-based interpreter for an extended version of AgentSpeak.” [Online]. Available: <http://jason.sourceforge.net/wp/>. [Accessed: 23-Jun-2020]
- [246] R. H. Bordini and J. F. Hübner, “BDI Agent Programming in AgentSpeak Using Jason,” in *Computational Logic in Multi-Agent Systems*, Berlin, Heidelberg, 2006, pp. 143–164, doi: 10.1007/11750734_9.

- [247] “AgentBuilder.” [Online]. Available: <https://www.agentbuilder.com/>. [Accessed: 31-Mar-2019]
- [248] “SeSAM - Integrated Environment for Multi-Agent Simulation.” [Online]. Available: <http://www.simsesam.de/>. [Accessed: 31-Mar-2019]
- [249] F. Klügl and F. Puppe, “The Multi-Agent Simulation Environment SeSAM,” in *University Paderborn*, 1998.
- [250] H. Xu and S. M. Shatz, “ADK: An Agent Development Kit Based on a Formal Design Model for Multi-Agent Systems,” *Autom. Softw. Eng.*, vol. 10, no. 4, pp. 337–365, Oct. 2003, doi: 10.1023/A:1025859021913.
- [251] J. Ferber and O. Gutknecht, “A meta-model for the analysis and design of organizations in multi-agent systems,” in *Proceedings International Conference on Multi Agent Systems (Cat. No.98EX160)*, 1998, pp. 128–135, doi: 10.1109/ICMAS.1998.699041.
- [252] “MaDKit.” [Online]. Available: <http://www.madkit.net/madkit/madkit.php>. [Accessed: 15-Aug-2017]
- [253] “MaSMT 3.0 Development Guide,” *ResearchGate*. [Online]. Available: https://www.researchgate.net/publication/319101813_MaSMT_30_Development_Guide. [Accessed: 08-Dec-2018]
- [254] B. Hettige and A. S. Karunananda, “Octopus: A Multi Agent Chatbot,” Proceedings of 8th International Research Conference, KDU, 2015.
- [255] H. Jayarathna and B. Hettige, “AgriCom: A communication platform for agriculture sector,” in *Industrial and Information Systems (ICIIS), 2013 8th IEEE International Conference on*, 2013, pp. 439–444.
- [256] M. A. S. T. Goonatilleke, M. W. G. Jayampath, and B. Hettige, “Rice Express: A Communication Platform for Rice Production Industry,” in *Artificial Intelligence*, 2019, pp. 269–277.
- [257] L. Weerasinghe, B. Hettige, R. P. S. Kathriarachchi, and A. S. Karunananda, “Resource Sharing in Distributed Environment using Multi-agent Technology,” *Resource*, vol. 167, no. 5, 2017.
- [258] T. D. Samaranayake, W. P. J. Pemarathane, and B. Hettige, “Solution for event-planning using multi-agent technology,” in *2017 Seventeenth International Conference on Advances in ICT for Emerging Regions (ICTer)*, 2017, pp. 1–6, doi: 10.1109/ICTER.2017.8257805.
- [259] K. Christianson, A. Hollingworth, J. F. Halliwell, and F. Ferreira, “Thematic Roles Assigned along the Garden Path Linger,” *Cognit. Psychol.*, vol. 42, pp. 368–407, 2001, doi: 10.1006/cogp.2001.0752.
- [260] L. Frazier, “Constraint satisfaction as a theory of sentence processing,” *J. Psycholinguist. Res.*, vol. 24, no. 6, pp. 437–468, Nov. 1995, doi: 10.1007/BF02143161.
- [261] D. Yu, W. Wei, L. Jia, and B. Xu, “Confidence estimation for spoken language translation based on Round Trip Translation,” in *2010 7th International Symposium on Chinese Spoken Language Processing*, 2010, pp. 426–429, doi: 10.1109/ISCSLP.2010.5684855.
- [262] M. Kulathunga, “Madura English-Sinhala Dictionary - Online Language Translator.” [Online]. Available: <https://www.maduraonline.com/>. [Accessed: 04-Feb-2019]

- [263] “Bhasha Dictionary | Sinhala-English Dictionary.” [Online]. Available: <http://www.bhasha.lk/products/dictionary>. [Accessed: 04-Feb-2019]
- [264] J. Tomás, J. À. Mas, and F. Casacuberta, “A Quantitative Method for Machine Translation Evaluation,” in *Proceedings of the EACL 2003 Workshop on Evaluation Initiatives in Natural Language Processing: are evaluation methods, metrics and resources reusable?*, Columbus, Ohio, 2003, pp. 27–34 [Online]. Available: <https://www.aclweb.org/anthology/W03-2804>. [Accessed: 21-Jun-2019]
- [265] M. Popović and H. Ney, “Towards Automatic Error Analysis of Machine Translation Output,” *Comput. Linguist.*, vol. 37, no. 4, pp. 657–688, 2011, doi: 10.1162/COLI_a_00072.
- [266] “Human Evaluation of Machine Translation,” 26-Jun-2016. [Online]. Available: <https://www.ebayinc.com/stories/blogs/tech/human-evaluation-of-machine-translation/>. [Accessed: 21-Jun-2019]
- [267] “Round Trip Translation Using PNMT Systems | SYSTRAN.” [Online]. Available: <https://blog.systransoft.com/round-trip-translation-no-more-entertainment-with-pnmt-systems/>. [Accessed: 23-Aug-2019]
- [268] “Round-trip translation - Semantic Scholar.” [Online]. Available: <https://www.semanticscholar.org/topic/Round-trip-translation/1058180>. [Accessed: 21-Jun-2019]
- [269] H. Somers, “Round-trip translation: what is it good for,” in *In proceedings of the Australasian Language Technology Workshop*, 2005, pp. 127–133.
- [270] M. Popović and H. Ney, “Word error rates: decomposition over Pos classes and applications for error analysis,” in *Proceedings of the Second Workshop on Statistical Machine Translation - StatMT '07*, Prague, Czech Republic, 2007, pp. 48–55, doi: 10.3115/1626355.1626362 [Online]. Available: <http://portal.acm.org/citation.cfm?doid=1626355.1626362>. [Accessed: 21-Jun-2019]
- [271] “Levenshtein Distance - an overview | ScienceDirect Topics.” [Online]. Available: <https://www.sciencedirect.com/topics/computer-science/levenshtein-distance>. [Accessed: 21-Jun-2019]
- [272] S. Rani and J. Singh, “Enhancing Levenshtein’s Edit Distance Algorithm for Evaluating Document Similarity,” in *Computing, Analytics and Networks*, 2018, pp. 72–80.
- [273] M. Thoma, “Word Error Rate Calculation,” *Martin Thoma*. [Online]. Available: [..//word-error-rate-calculation/](#). [Accessed: 08-Sep-2019]
- [274] L. Han, “Machine Translation Evaluation Resources and Methods: A Survey,” *ArXiv160504515 Cs, Sep. 2018* [Online]. Available: <http://arxiv.org/abs/1605.04515>. [Accessed: 23-Jun-2020]
- [275] M. Snover, B. Dorr, R. Schwartz, L. Micciulla, and J. Makhoul, “A Study of Translation Edit Rate with Targeted Human Annotation,” p. 9.
- [276] M. Popovic, “Class error rates for evaluation of machine translation output,” *Proceedings of the Seventh Workshop on Statistical Machine Translation*, 2012
- [277] K. Papineni, S. Roukos, T. Ward, and W.-J. Zhu, “BLEU: A Method for Automatic Evaluation of Machine Translation,” in *Proceedings of the 40th Annual Meeting on Association for Computational Linguistics*, Stroudsburg, PA,

- USA, 2002, pp. 311–318, doi: 10.3115/1073083.1073135 [Online]. Available: <https://doi.org/10.3115/1073083.1073135>. [Accessed: 21-Jun-2019]
- [278] K. Papineni, S. Roukos, T. Ward, and W.-J. Zhu, “Bleu: a Method for Automatic Evaluation of Machine Translation,” in *Proceedings of the 40th Annual Meeting of the Association for Computational Linguistics*, Philadelphia, Pennsylvania, USA, 2002, pp. 311–318, doi: 10.3115/1073083.1073135 [Online]. Available: <https://www.aclweb.org/anthology/P02-1040>. [Accessed: 21-Jun-2019]
- [279] B. Chen and C. Cherry, “A Systematic Comparison of Smoothing Techniques for Sentence-Level BLEU,” in *Proceedings of the Ninth Workshop on Statistical Machine Translation*, Baltimore, Maryland, USA, 2014, pp. 362–367, doi: 10.3115/v1/W14-3346 [Online]. Available: <http://aclweb.org/anthology/W14-3346>. [Accessed: 08-Sep-2019]
- [280] “Index — NLTK 3.4.5 documentation.” [Online]. Available: <https://www.nltk.org/genindex.html>. [Accessed: 14-Sep-2019]
- [281] “donnabelldmello/nlp-bleu,” GitHub. [Online]. Available: <https://github.com/donnabelldmello/nlp-bleu>. [Accessed: 13-Sep-2019]
- [282] S. Banerjee and A. Lavie, “METEOR: An Automatic Metric for MT Evaluation with Improved Correlation with Human Judgments,” p. 8.
- [283] A. Gupta, S. Venkatapathy, and R. Sangal, “METEOR-Hindi : Automatic MT Evaluation Metric for Hindi as a Target Language,” 2010.
- [284] M. Denkowski and A. Lavie, “Choosing the Right Evaluation for Machine Translation: an Examination of Annotator and Automatic Metric Performance on Human Judgment Tasks,” p. 9.
- [285] E. Chatzikoumi, “How to evaluate machine translation: A review of automated and human metrics,” *Nat. Lang. Eng.*, vol. 26, no. 2, pp. 137–161, Mar. 2020, doi: 10.1017/S1351324919000469.
- [286] M. S. Maučec and G. Donaj, “Machine Translation and the Evaluation of Its Quality,” *Recent Trends Comput. Intell.*, Sep. 2019, doi: 10.5772/intechopen.89063. [Online]. Available: <https://www.intechopen.com/books/recent-trends-in-computational-intelligence/machine-translation-and-the-evaluation-of-its-quality>. [Accessed: 22-Jun-2020]
- [287] “Evaluation of machine translation,” *Wikipedia*. 09-Nov-2017 [Online]. Available: https://en.wikipedia.org/w/index.php?title=Evaluation_of_machine_translation&oldid=809464440. [Accessed: 10-Nov-2017]
- [288] “A Comparatives Study of Machine Translation Evaluation Systems | July 2016 | Translation Journal.” [Online]. Available: <https://translationjournal.net/July-2016/a-comparatives-study-of-machine-translation-evaluation-systems.html>. [Accessed: 22-Jun-2020]
- [289] P. Koehn and C. Monz, “Manual and automatic evaluation of machine translation between European languages,” in *Proceedings of the Workshop on Statistical Machine Translation - StatMT '06*, New York City, New York, 2006, p. 102, doi: 10.3115/1654650.1654666 [Online]. Available:

- <http://portal.acm.org/citation.cfm?doid=1654650.1654666>. [Accessed: 21-Jun-2019]
- [290] H. Li, “Adequacy-Fluency Metrics (AM-FM) for Machine Translation (MT) Evaluation,” p. 45.
- [291] G. M. Sullivan and A. R. Artino, “Analyzing and Interpreting Data From Likert-Type Scales,” *J. Grad. Med. Educ.*, vol. 5, no. 4, pp. 541–542, Dec. 2013, doi: 10.4300/JGME-5-4-18.
- [292] J. Sim and C. C. Wright, “The Kappa Statistic in Reliability Studies: Use, Interpretation, and Sample Size Requirements,” *Phys. Ther.*, vol. 85, no. 3, pp. 257–268, Mar. 2005, doi: 10.1093/ptj/85.3.257.
- [293] “Kappa Statistics - an overview | ScienceDirect Topics.” [Online]. Available: <https://www.sciencedirect.com/topics/medicine-and-dentistry/kappa-statistics>. [Accessed: 03-Aug-2019]
- [294] “Cohen’s Kappa | Real Statistics Using Excel.” [Online]. Available: <http://www.real-statistics.com/reliability/interrater-reliability/cohens-kappa/>. [Accessed: 15-Sep-2019]
- [295] M. Martindale and M. Carpuat, “Fluency Over Adequacy: A Pilot Study in Measuring User Trust in Imperfect MT,” in *Proceedings of the 13th Conference of the Association for Machine Translation in the Americas (Volume 1: Research Papers)*, Boston, MA, 2018, pp. 13–25 [Online]. Available: <https://www.aclweb.org/anthology/W18-1803>. [Accessed: 24-Aug-2019]
- [296] L. Puka, “Kendall’s Tau,” in *International Encyclopedia of Statistical Science*, M. Lovric, Ed. Berlin, Heidelberg: Springer, 2011, pp. 713–715 [Online]. Available: https://doi.org/10.1007/978-3-642-04898-2_324. [Accessed: 23-Jun-2020]
- [297] “How good is Google translate? The most accurate language pairs.” [Online]. Available: <https://www.betranslated.com/blog/how-good-is-google-translate/>. [Accessed: 09-Jul-2020]
- [298] “5 Reasons Not to Rely on Google Translate,” *Clear Words Translations*, 18-Oct-2019. [Online]. Available: <http://clearwordstranslations.com/5-reasons-not-to-rely-on-google-translate/>. [Accessed: 09-Jul-2020]
- [299] “The Pros and Cons of Google Translate,” *Language Connections*. [Online]. Available: <https://www.languageconnections.com/blog/the-pros-cons-of-google-translate/>. [Accessed: 11-Jul-2020]
- [300] “Google Translate accuracy – why it’s such a mixed bag,” *PacTranz*, 26-Aug-2014. [Online]. Available: <https://www.pactranz.com/google-translate-accuracy-issues/>. [Accessed: 11-Jul-2020]
- [301] X. Chen, S. Acosta, and A. E. Barry, “Evaluating the Accuracy of Google Translate for Diabetes Education Material,” *JMIR Diabetes*, vol. 1, no. 1, Jun. 2016, doi: 10.2196/diabetes.5848. [Online]. Available: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6238856/>. [Accessed: 11-Jul-2020]
- [302] *Sentences, English Linguistics for Language teaching*. Department of Distence Education, NIE.