

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
14 July 2022 (14.07.2022)



(10) International Publication Number
WO 2022/150009 A1

(51) International Patent Classification:

G06N 3/04 (2006.01) G06N 20/00 (2019.01)
G06N 3/063 (2006.01) G06N 99/00 (2019.01)

(21) International Application Number:

PCT/SG2021/050010

(22) International Filing Date:

08 January 2021 (08.01.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North Tower, Singapore 138632 (SG).

(72) Inventors: **TAN, Hong Meng Benjamin**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis South Tower, Singapore, Singapore 138632 (SG). **MEFTAH, Souhail**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis

South Tower, Singapore, Singapore 138632 (SG). **AUNG, Khin Mi Mi**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis South Tower, Singapore, Singapore 138632 (SG).

(74) Agent: **VIERING, JENTSCHURA & PARTNER LLP**; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(54) Title: GENERATING AN OUTPUT FOR A RECTIFIED LINEAR UNIT (ReLU)-ACTIVATED NEURON OF A NEURAL NETWORK

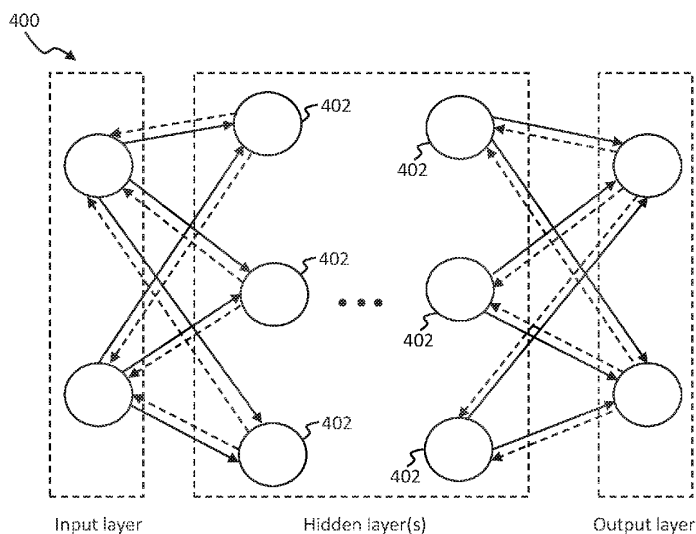


FIG. 4

(57) Abstract: In some aspects, a set of input elements is obtained, at a rectified linear unit-activated neuron of a neural network based, on input data at the neuron. A first group and a second group of input elements are generated based on the set of input elements. The first group and the second group of input elements are associated with first weight elements and second weight elements, respectively. A first value is generated based on the first group of input elements and the first weight elements. A second value is generated based on the second group of input elements and the second weight elements. A third value and a fourth value are respectively generated based on a first operation and a second operation on the first value and the second value. An output of the neuron is generated based on the third value and the fourth value.

[Continued on next page]

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*