



(51) International Patent Classification:

G06T 7/70 (2017.01) H04L 65/403 (2022.01)
G06V 20/40 (2022.01) H04N 7/15 (2006.01)
G06V 40/20 (2022.01)

(21) International Application Number:

PCT/US2022/025427

(22) International Filing Date:

19 April 2022 (19.04.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

17/678,954 23 February 2022 (23.02.2022) US

(71) Applicant: **HUDDLY INC.** [US/US]; 2345 Yale Street,
Palo Alto, CA 94301 (US).

(72) Inventors: **HAFSTAD, Jon, Tore**; Holtegata 14, 0259
Oslo (NO). **LOPEZ, Aida, C.**; Nedre Silkestrå 18, 0375
Oslo (NO). **YOU, Elena**; Sorengkaia 9, 0194 Oslo (NO).
WIG, Kai, Alexander; Rolf Hofmos Gate, 0655 Oslo
(NO). **STENSEN, Lars, Erling**; Christies Gate 34a, 0557
Oslo (NO). **LAURITZEN, Mona, Kleven**; Sannergata
6e, 0557 Oslo (NO). **SELBEK, Stian**; Lensmannssvingen
21, 2480 Koppang (NO). **BECSEI, Tamas**; Ullevålsveien
105, 0359 Oslo (NO). **SCHMIDT, Niklas**; Møllergata 48
H0202, 0179 Oslo (NO). **BYHRING, Therese**; Grønvoll
Allé 13a, 0663 Oslo (NO). **NILSSEN, Vebjørn, Boge**;
Bjerregaards Gate 10, 0172 Oslo (NO). **HANSEN, Patrik,**
Kvarme; Sarpsborggata 9b, 0468 Oslo (NO). **TEPPAN,**
Knut, Helge; Korpåsen 81b, 1386 Asker (NO).

(74) Agent: **LOMBARDI, Anthony J.**; Finnegan, Henderson,
Farabow, Garrett & Dunner LLP, 901 New York Avenue,
NW, Washington, DC 20001-4413 (US).

(54) Title: AUTONOMOUS VIDEO CONFERENCING SYSTEM WITH VIRTUAL DIRECTOR ASSISTANCE

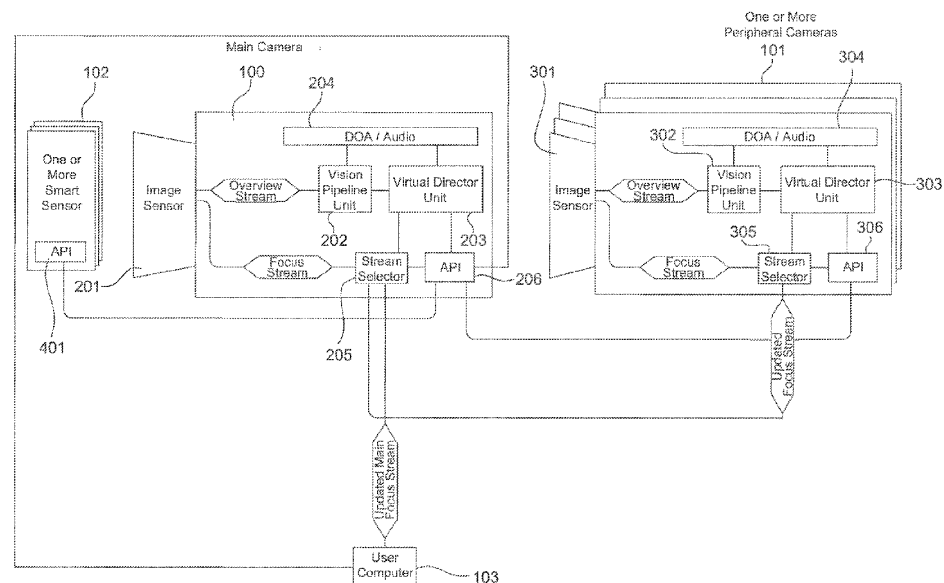


FIG. 1

(57) **Abstract:** Systems and methods are provided to power video conferencing and remote collaboration with subsymbolic and symbolic artificial intelligence. The autonomous video conferencing systems of this disclosure include one main smart camera and multiple peripheral smart cameras, optionally coupled with one or more smart sensors. Each smart camera is equipped with a vision pipeline supported by machine learning to detect objects and their interactions as well as related changes in gesture and posture, and a virtual director adapted to apply a predetermined rule set consistent with television studio production principles. The main camera is adapted to select and update a focus video stream in real time under the direction of its virtual director and stream the updated focus stream to a user computer. Methods for creating an automated television studio production for a variety of conferencing spaces and special-purpose scenarios with virtual director assistance are provided.

(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, JM, 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.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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))