

(54) **PREDICTING HOUSEHOLD
DEMOGRAPHICS BASED ON IMAGE DATA**

(57) **ABSTRACT**

(71) Applicant: **Facebook, Inc.**, Menlo Park, CA (US)

(72) Inventors: **William Bullock**, Palo Alto, CA (US);
Liang Xu, Bellevue, WA (US); **Li Zhou**, Campbell, CA (US)

(21) Appl. No.: **15/592,108**

(22) Filed: **May 10, 2017**

Publication Classification

(51) **Int. Cl.**
H04L 29/08 (2006.01)
G06F 17/27 (2006.01)

(52) **U.S. Cl.**
CPC **H04L 67/327** (2013.01); **G06K 9/00677**
(2013.01); **H04L 67/306** (2013.01); **G06F**
17/2785 (2013.01)

An online system predicts household features of a user, e.g., household size and demographic composition, based on image data of the user, e.g., profile photos, photos posted by the user and photos posted by other users socially connected with the user, and textual data in the user's profile that suggests relationships among individuals shown in the image data of the user. The online system applies one or more models trained using deep learning techniques to generate the predictions. For example, a trained image analysis model identifies each individual depicted in the photos of the user; a trained text analysis model derive household member relationship information from the user's profile data and tags associated with the photos. The online system uses the predictions to build more information about the user and his/her household in the online system, and provide improved and targeted content delivery to the user and the user's household.

