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(71) Applicant: VISA INTERNATIONAL SERVICE
ASSOCIATION [US/US]; P.O. Box 8999, San Francisco,
California 94128 (US).

(72) Inventors: MOHASSEL, Payman; PO Box 8999, San
Francisco, California 94128 (US). TRIEU, Ni; PO Box
8999, San Francisco, California 94128 (US).

(74) Agent: RACZKOWSKI, David B. et al.; Kilpatrick,
Townsend & Stockton LLP, 1100 Peachtree Street Suite
2800, Atlanta, Georgia 30309 (US).

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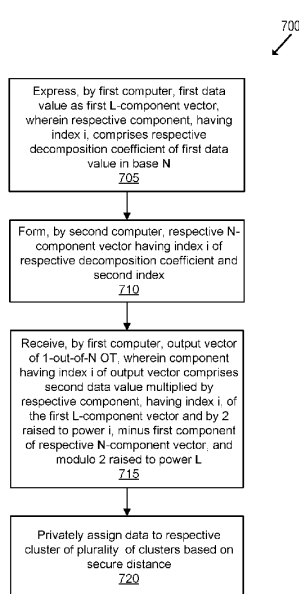


FIG. 7A

(57) Abstract: Described herein are systems and techniques for privacy-preserving unsupervised learning. The disclosed system and methods can enable separate computers, operated by separate entities, to perform unsupervised learning jointly based on a pool of their respective data, while preserving privacy. The system improves efficiency and scalability, while preserving privacy and avoids leaking a cluster identification. The system can jointly compute a secure distance via privacy-preserving multiplication of respective data values x and y from the computers based on a 1-out-of- N oblivious transfer (OT). In various embodiments, N may be 2, 4, or some other number of shares. A first computer can express its data value x in base- N . A second computer can form an $l \times N$ matrix comprising l random numbers m_i, o and the remaining elements $m_{i,o} = (y j N^i - m_{i,o}) \bmod N^l$. The first computer can receive an output vector from the OT, having components $m_i = (y x i N^i - m_{i,o}) \bmod N^l$.

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