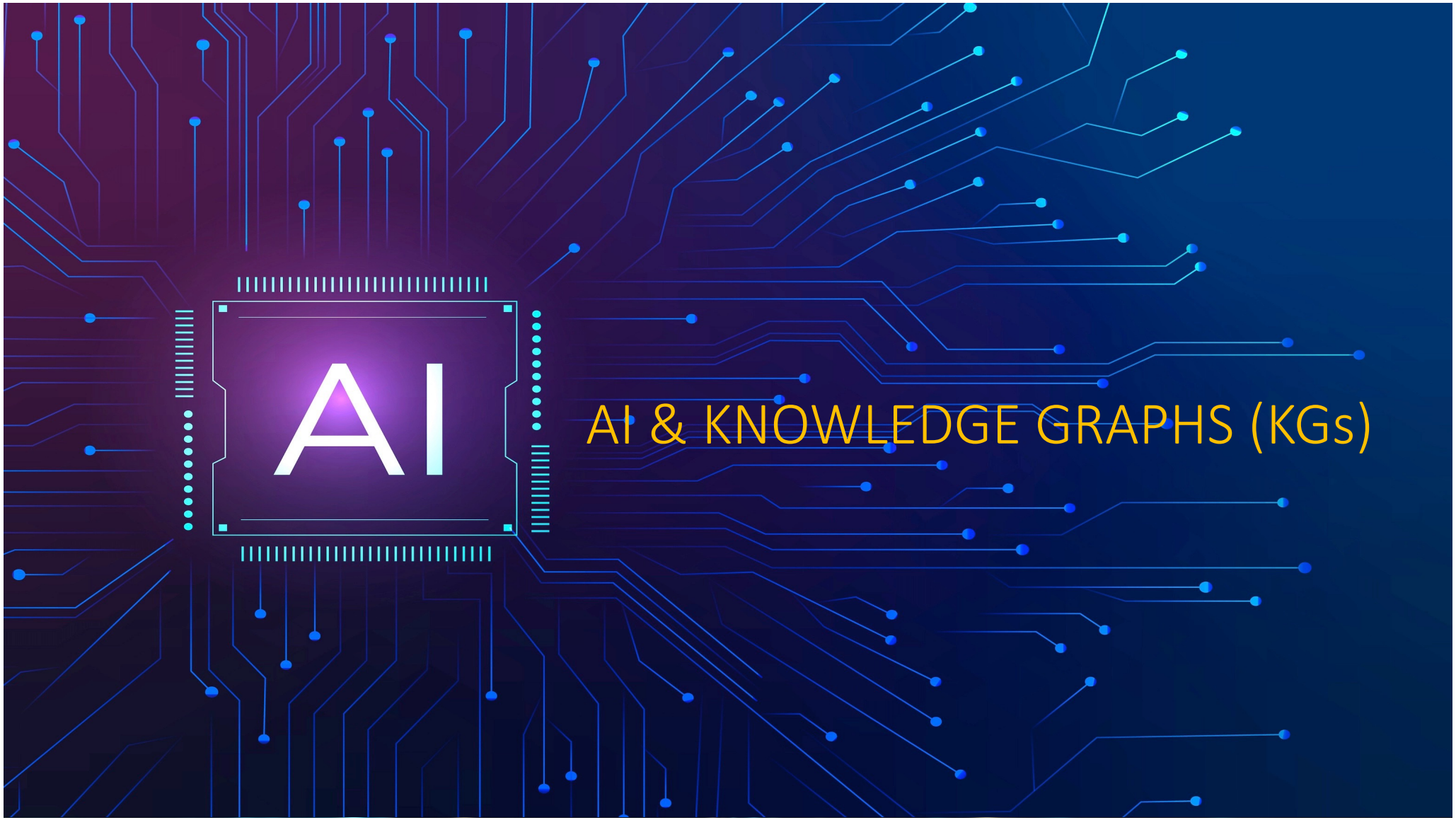
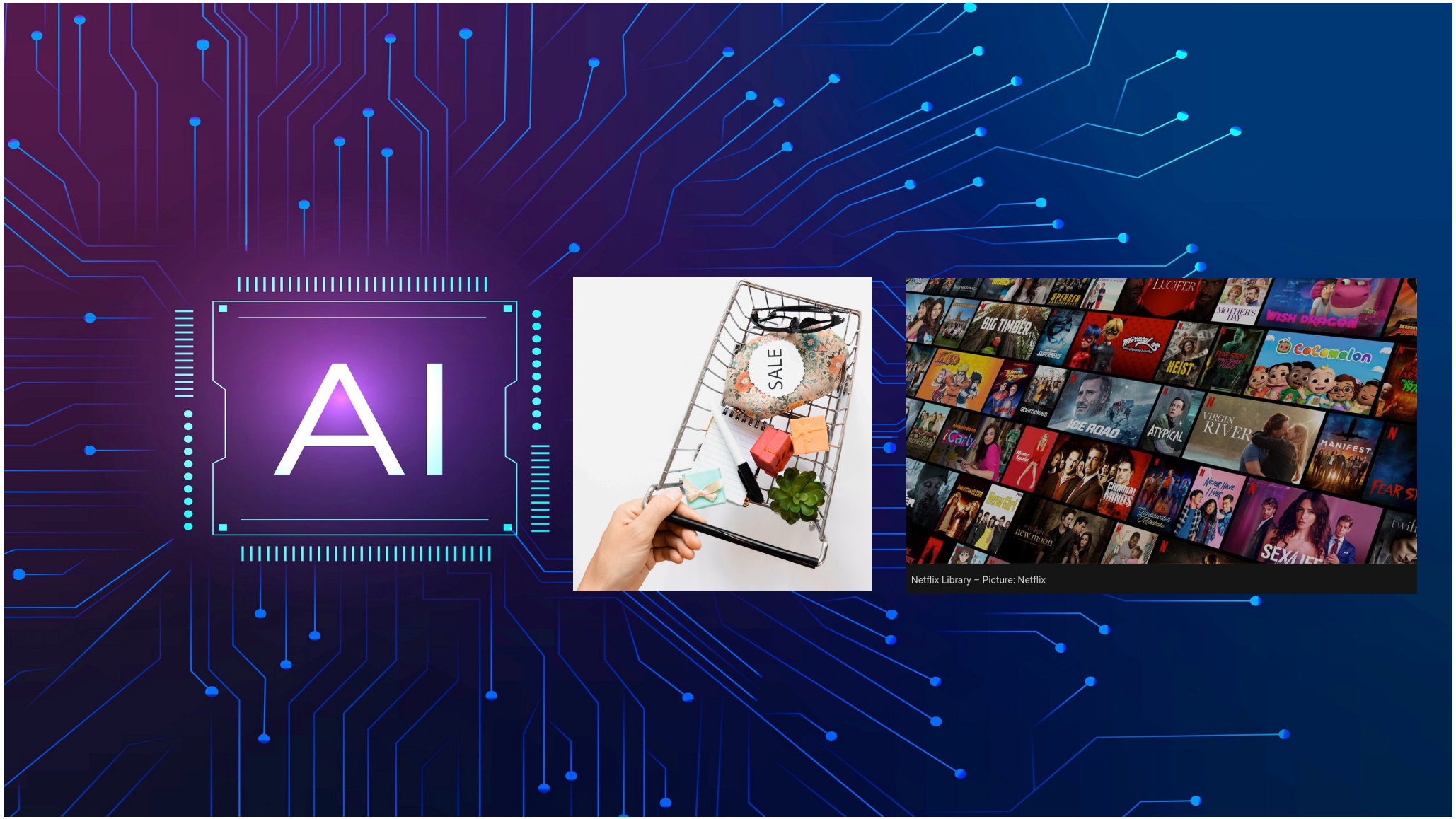
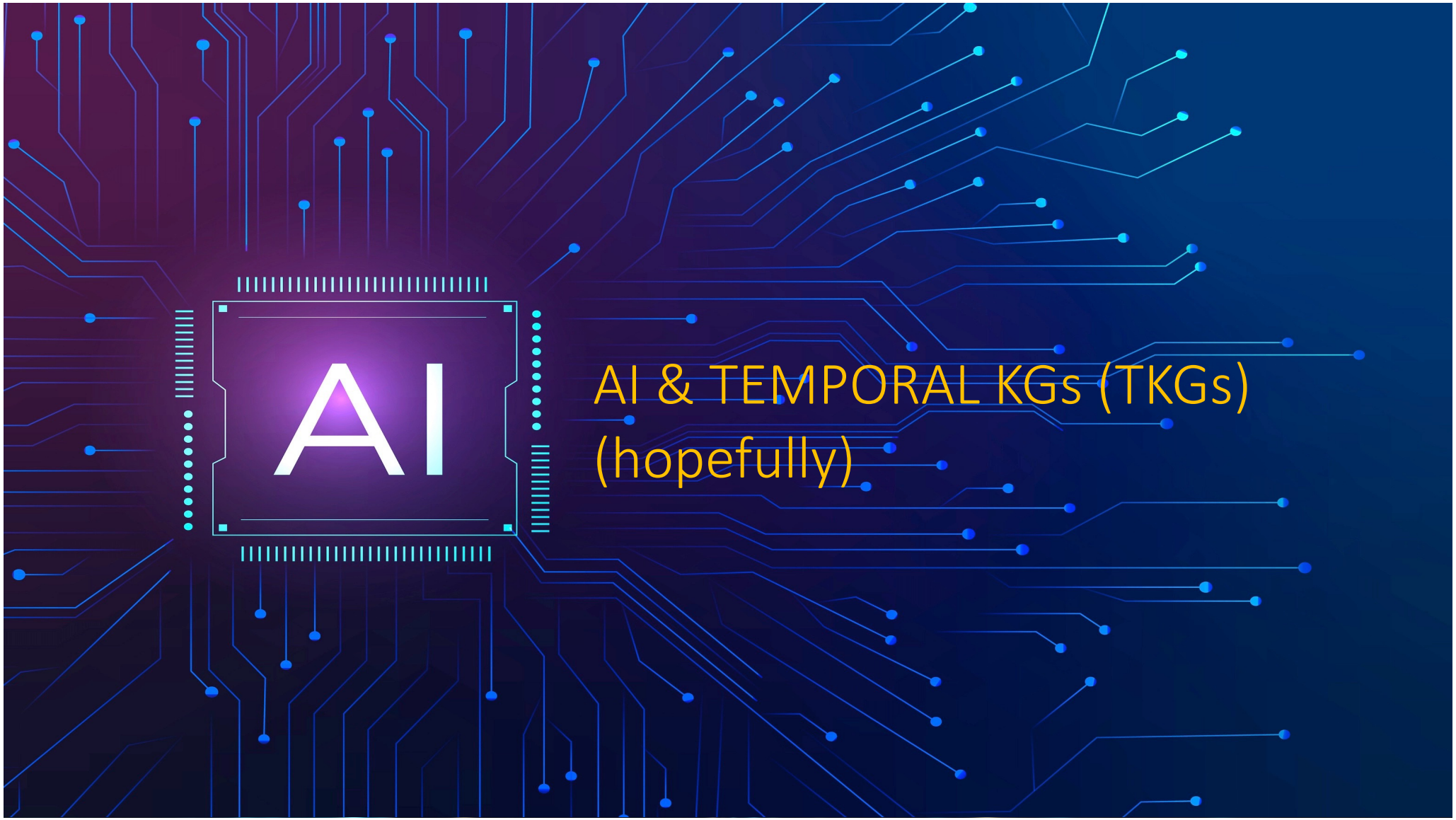
AI &TEMPORAL KNOWLEDGE GRAPH COMPLETION

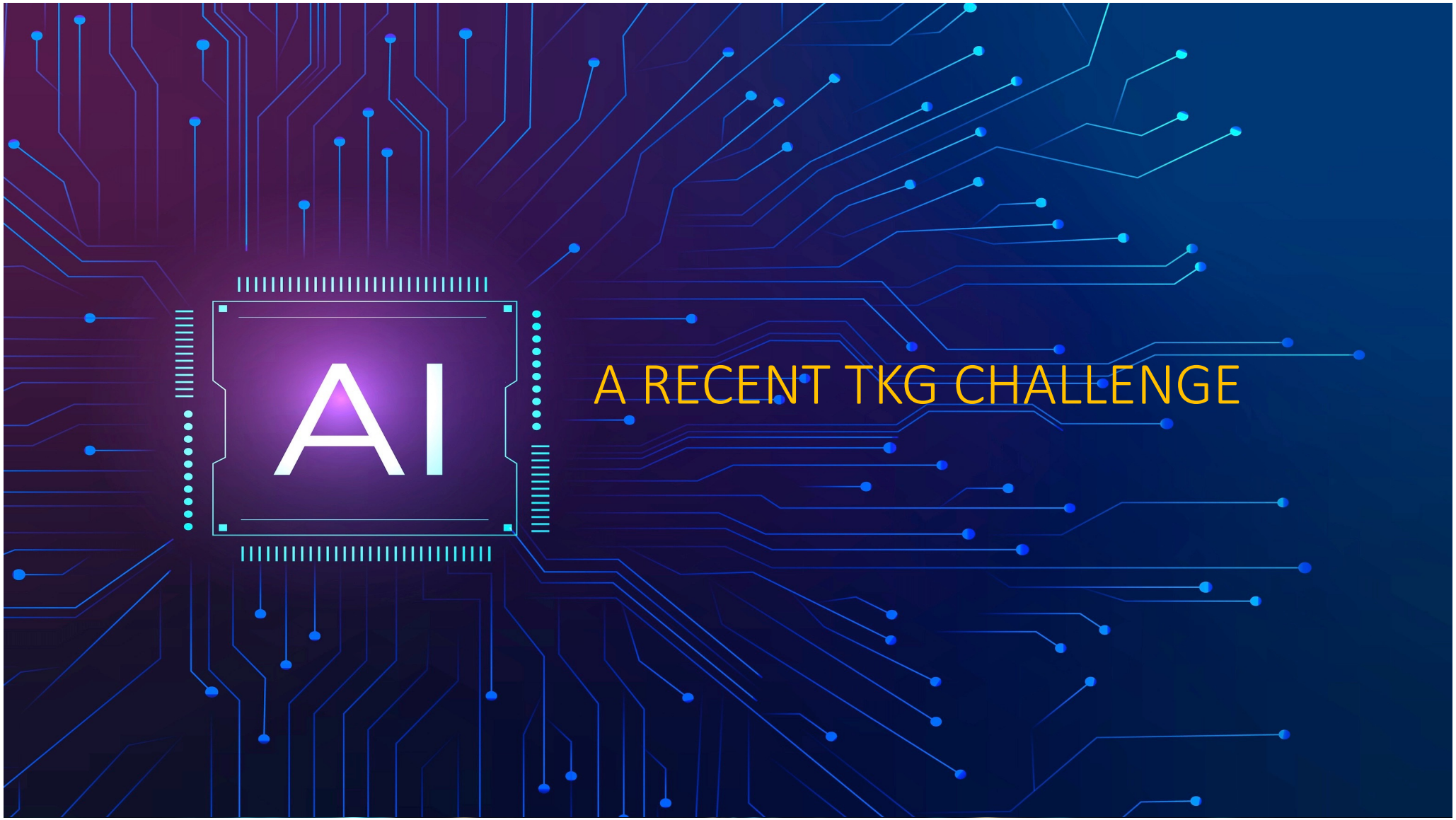
Tutorial Lecture:
Future AI Systems & Temporal Knowledge Graph Completion
Lecturer/Discussion Leader:
Dr. Steve Chan, VTIRL,VT/I-PAC, USA
Chair:
Prof. Dr. Petre Dini, IARIA, USA/EU

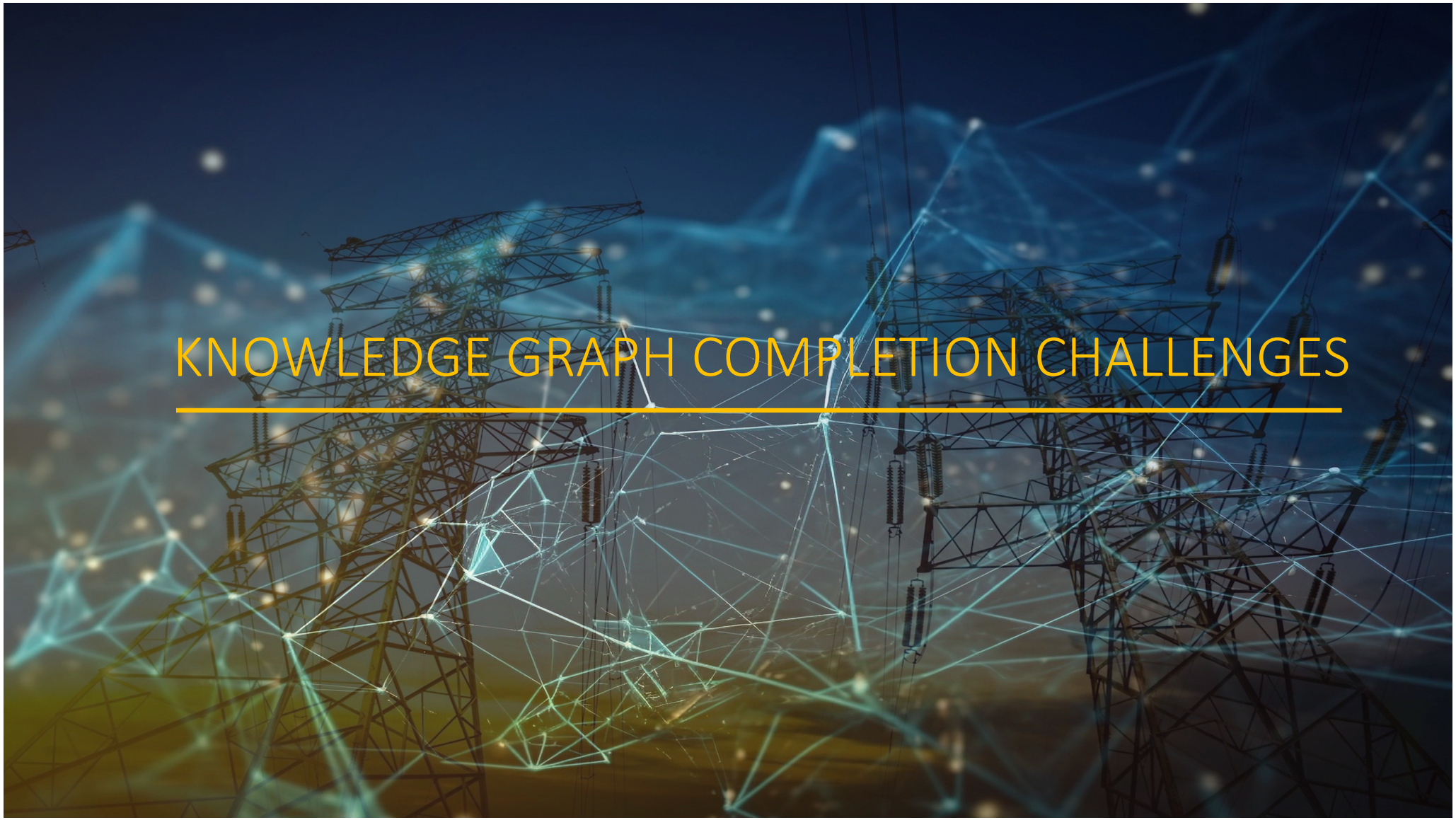

AI
AI & KNOWLEDGE GRAPHS (KGs)

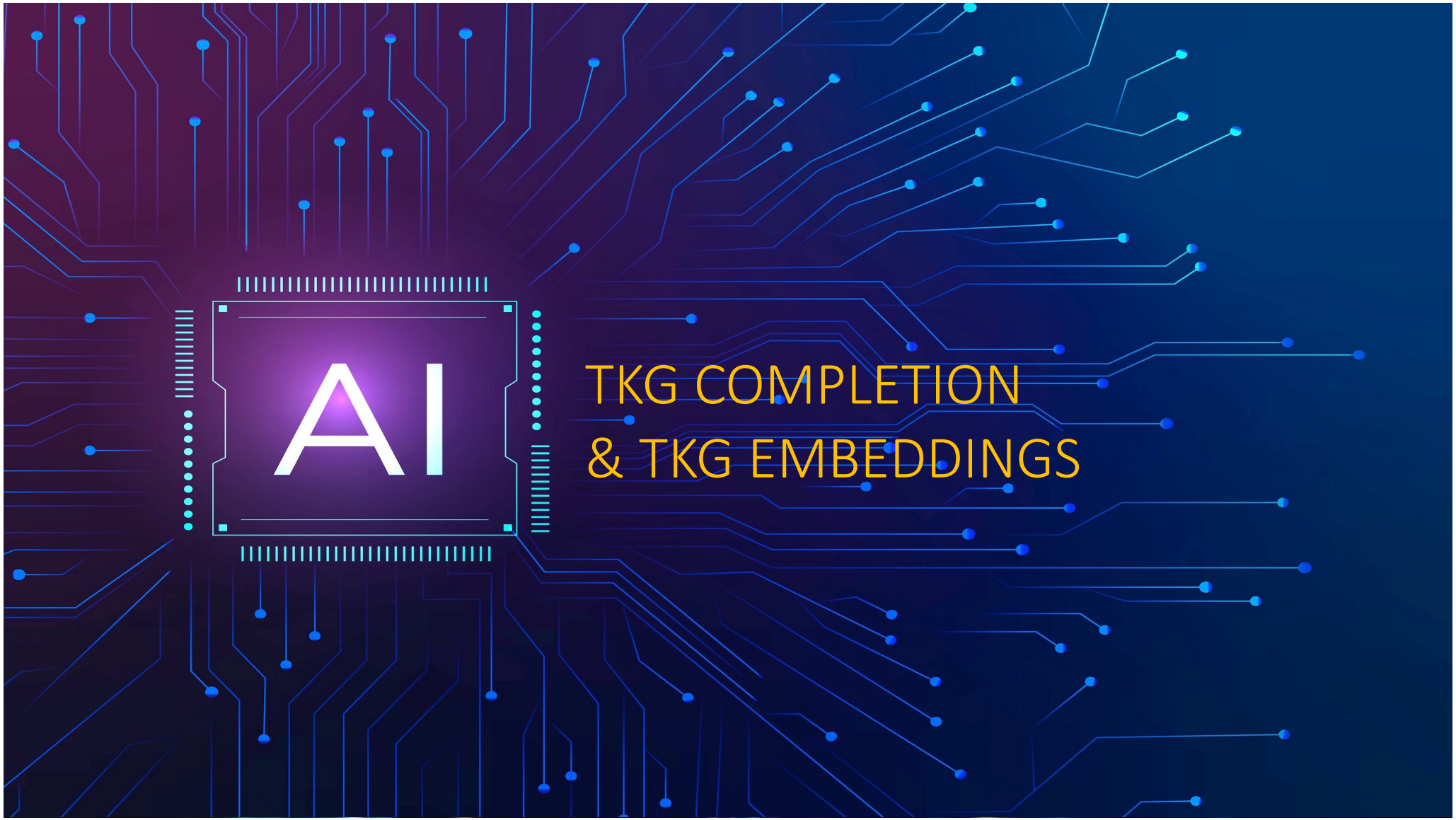


Netflix Library – Picture: Netflix

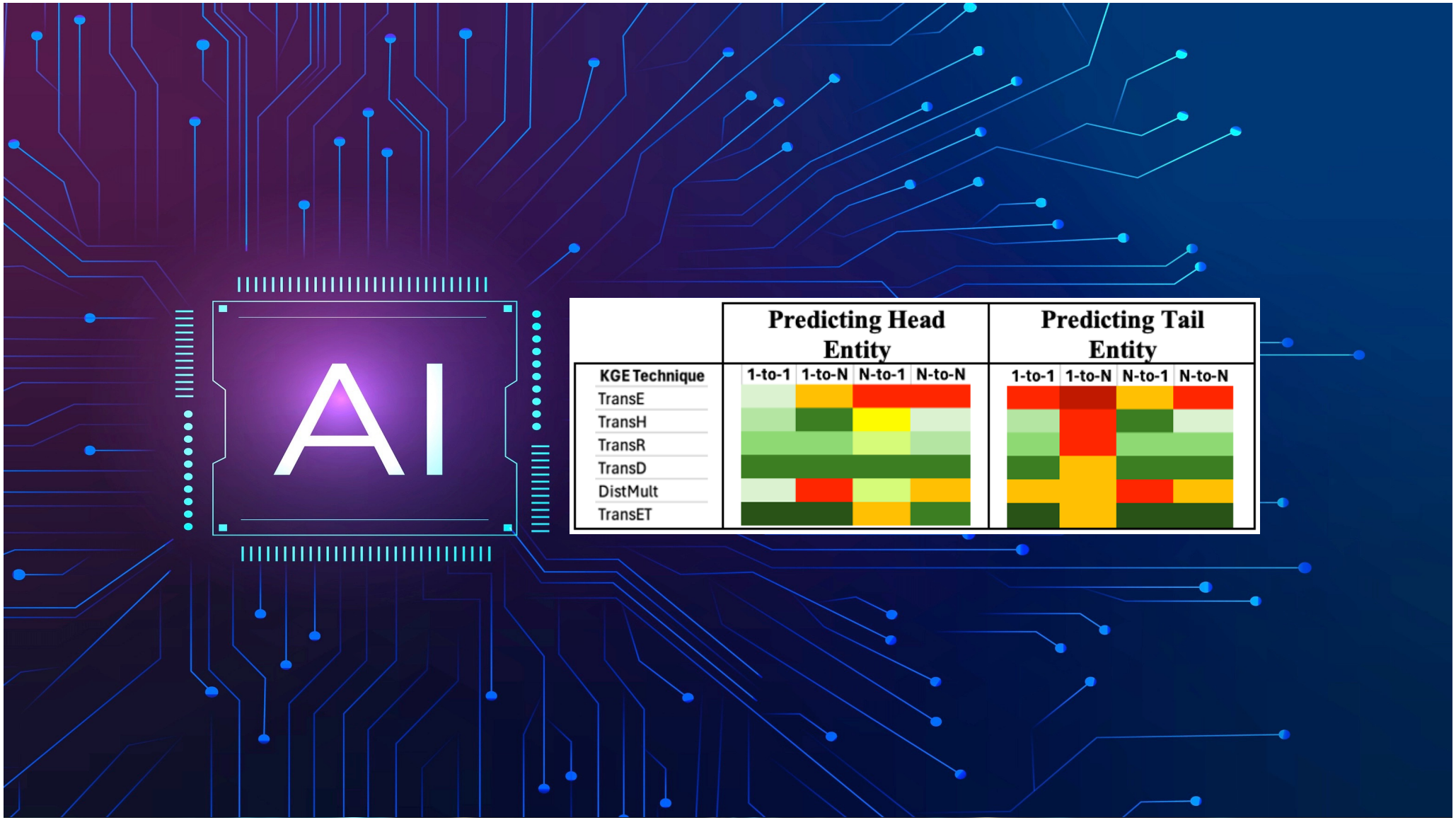

AI
AI & TEMPORAL KGs (TKGs)
(hopefully)

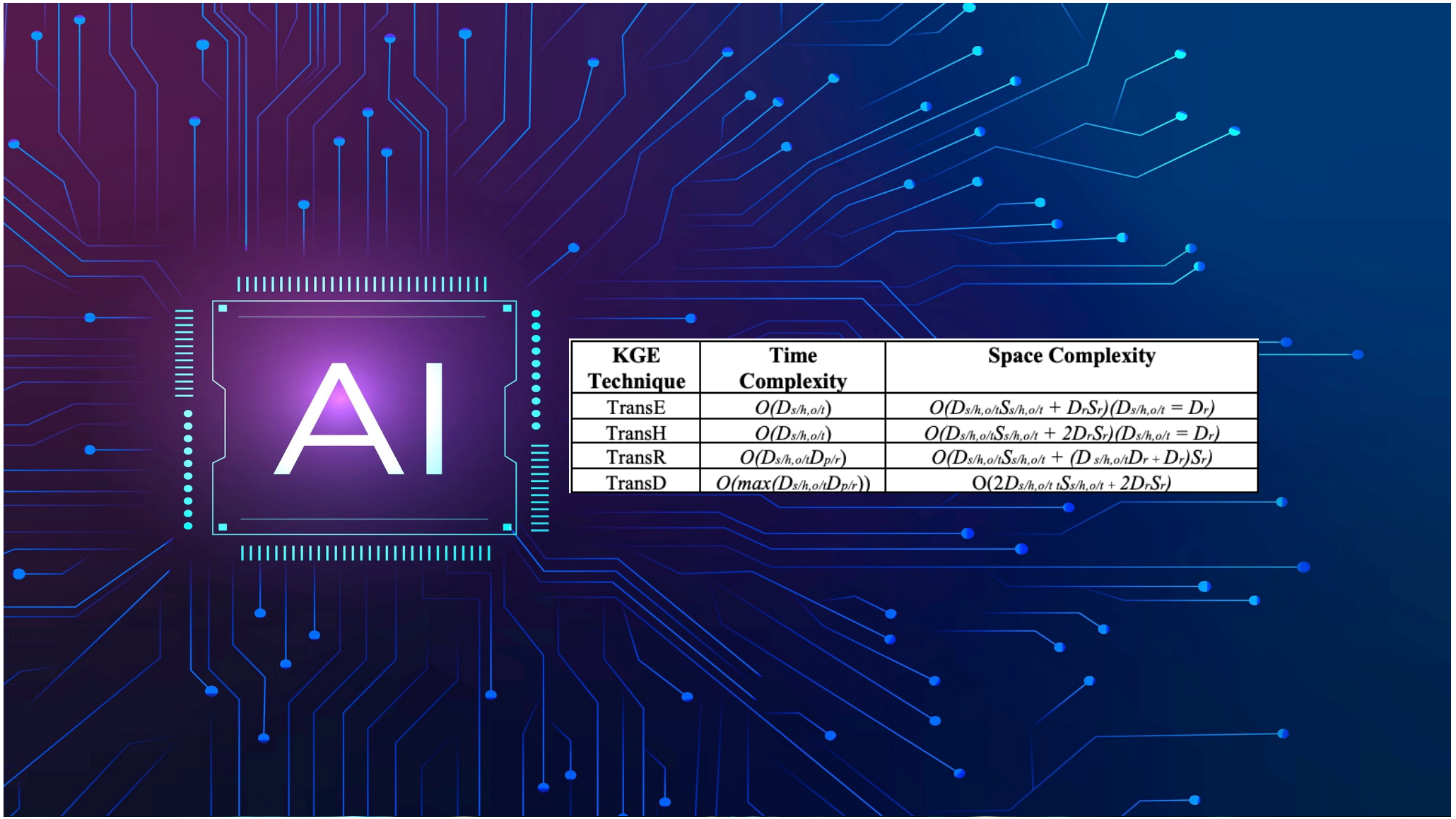

AI
A RECENT TKG CHALLENGE


KNOWLEDGE GRAPH COMPLETION CHALLENGES

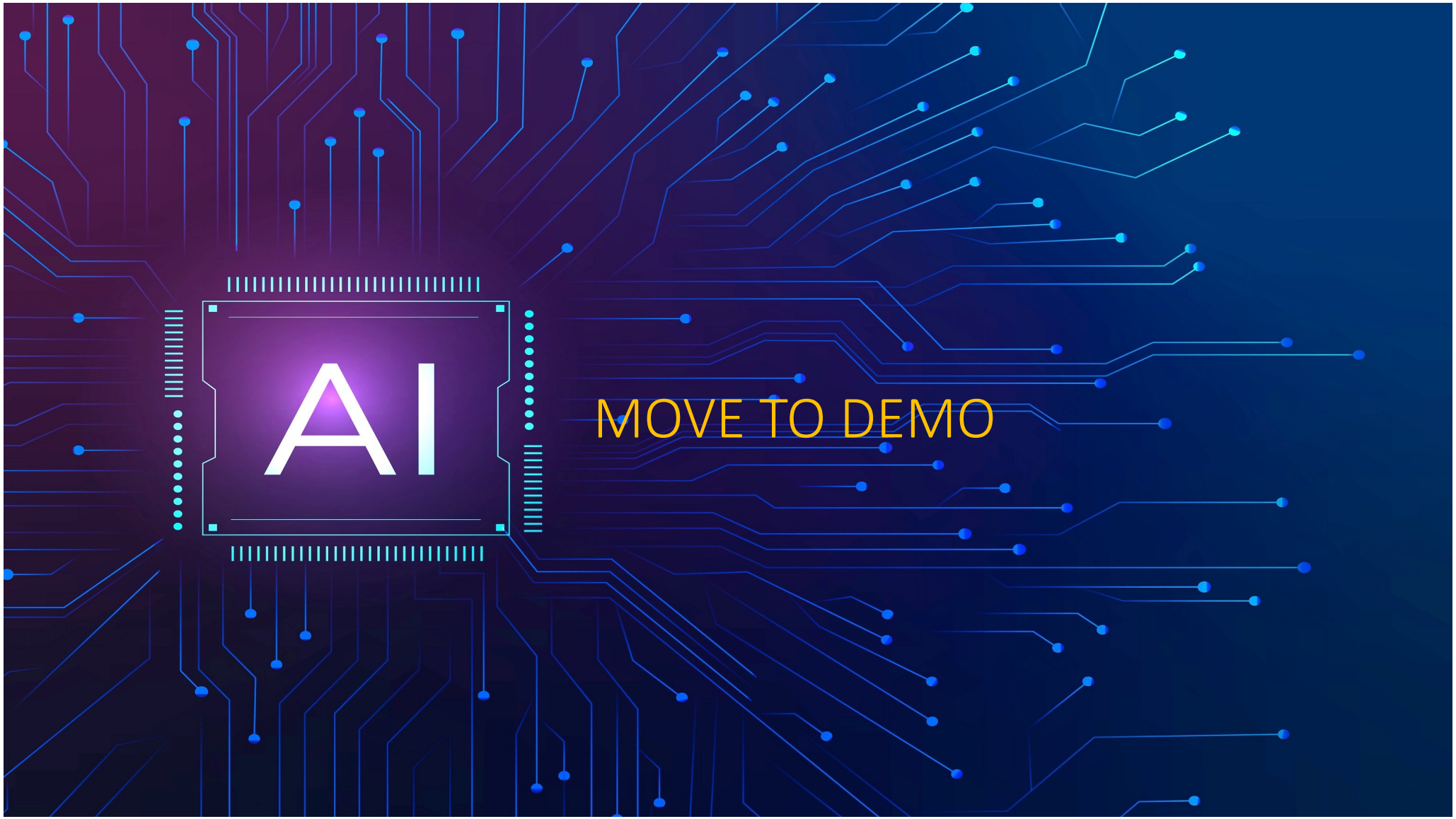


TKG COMPLETION & TKG EMBEDDINGS


AI
Predicting Head Entity
Predicting Tail Entity
KGE Technique
1-to-1
1-to-N
N-to-1
N-to-N
TransE
TransH
TransR
TransD
DistMult
TransET



KGE Technique	Time Complexity	Space Complexity
TransE	$O(D_{s/h,o/t})$	$O(D_{s/h,o/t}S_{s/h,o/t} + D_rS_r)(D_{s/h,o/t} = D_r)$
TransH	$O(D_{s/h,o/t})$	$O(D_{s/h,o/t}S_{s/h,o/t} + 2D_rS_r)(D_{s/h,o/t} = D_r)$
TransR	$O(D_{s/h,o/t}D_{p/r})$	$O(D_{s/h,o/t}S_{s/h,o/t} + (D_{s/h,o/t}D_r + D_r)S_r)$
TransD	$O(max(D_{s/h,o/t}D_{p/r}))$	$O(2D_{s/h,o/t}S_{s/h,o/t} + 2D_rS_r)$


AI
MOVE TO DEMO


AI


AI


AI


AI
THANK YOU!