NRI: FND: Learning Visual Dynamics from Interaction

PIs: Carl Vondrick and Hod Lipson

Key Personnel: Boyuan Chen, Robert Kwiatkowski, Mia Chiquier
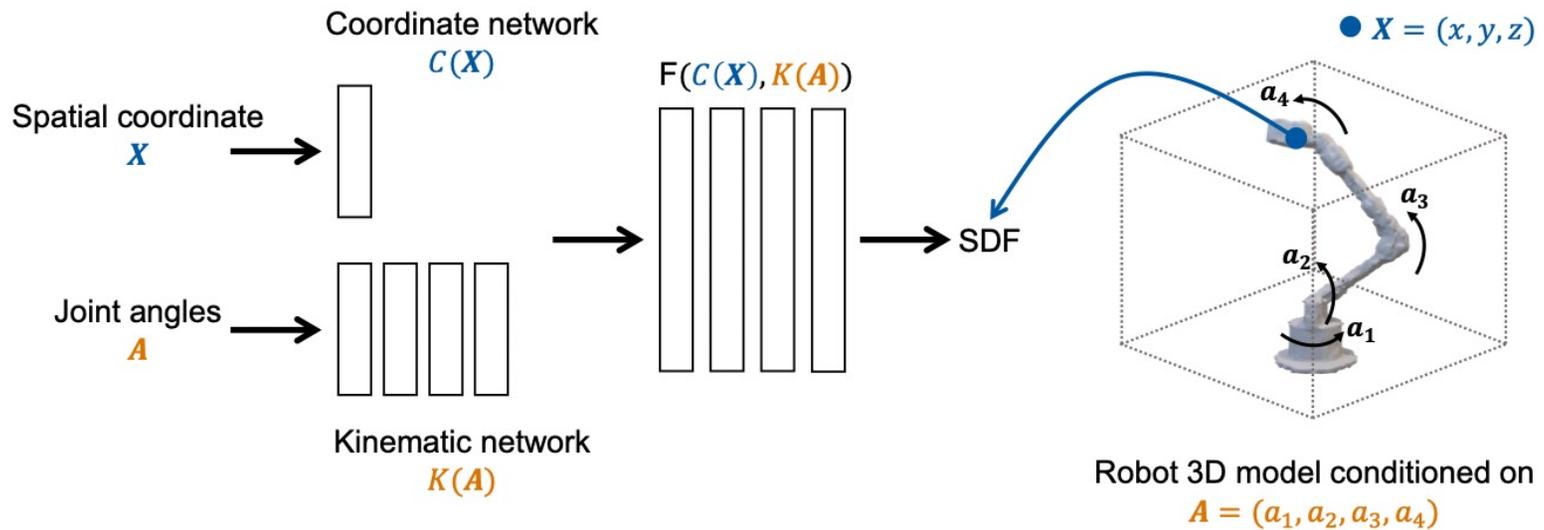
Lead Institution: Columbia University

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Full-Body Visual Self-Model

Full-Body Visual Self-Model

Coordinate network
$C(X)$

Spatial coordinate
X

Joint angles
A

Kinematic network
$K(A)$

$F(C(X), K(A))$

SDF

$X = (x, y, z)$

a_4

a_3

a_2

a_1

Robot 3D model conditioned on
$A = (a_1, a_2, a_3, a_4)$

Broader Impacts

- Research products are integrated into undergraduate courses in mechanical engineering and computer science courses about robotics to introduce students to computer vision and robot control perception

- Self-models will enable robots to handle more more realistic situations where situations are dynamics, such as in places of work or emergency situations

- Project provides training for two graduate students in interdisciplinary research at the intersection of mechanical engineering and computer science

- Project has provided hands-on research opportunities for two undergraduate students in computer science

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