

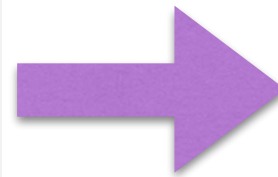
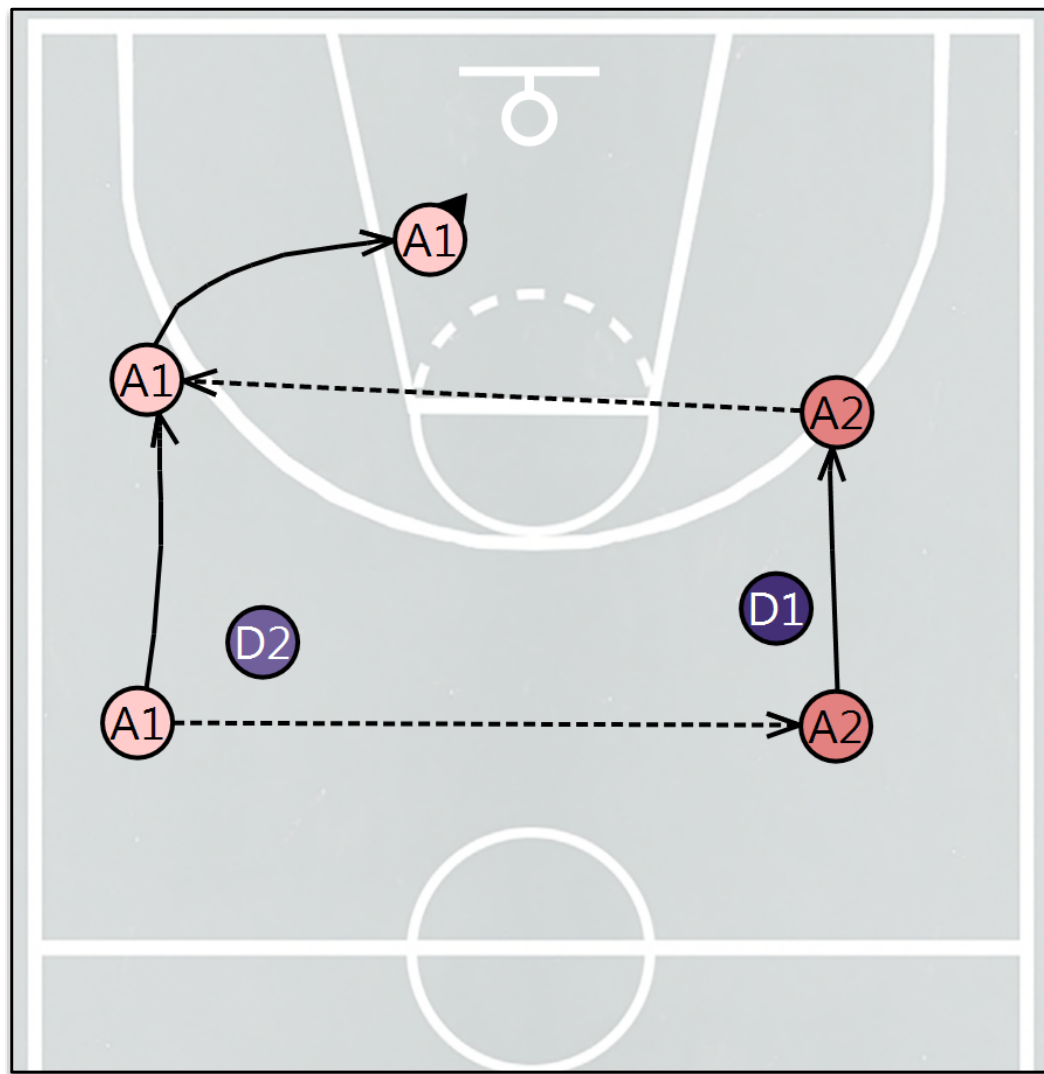
Motion Grammars for Character Animation

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Introduction

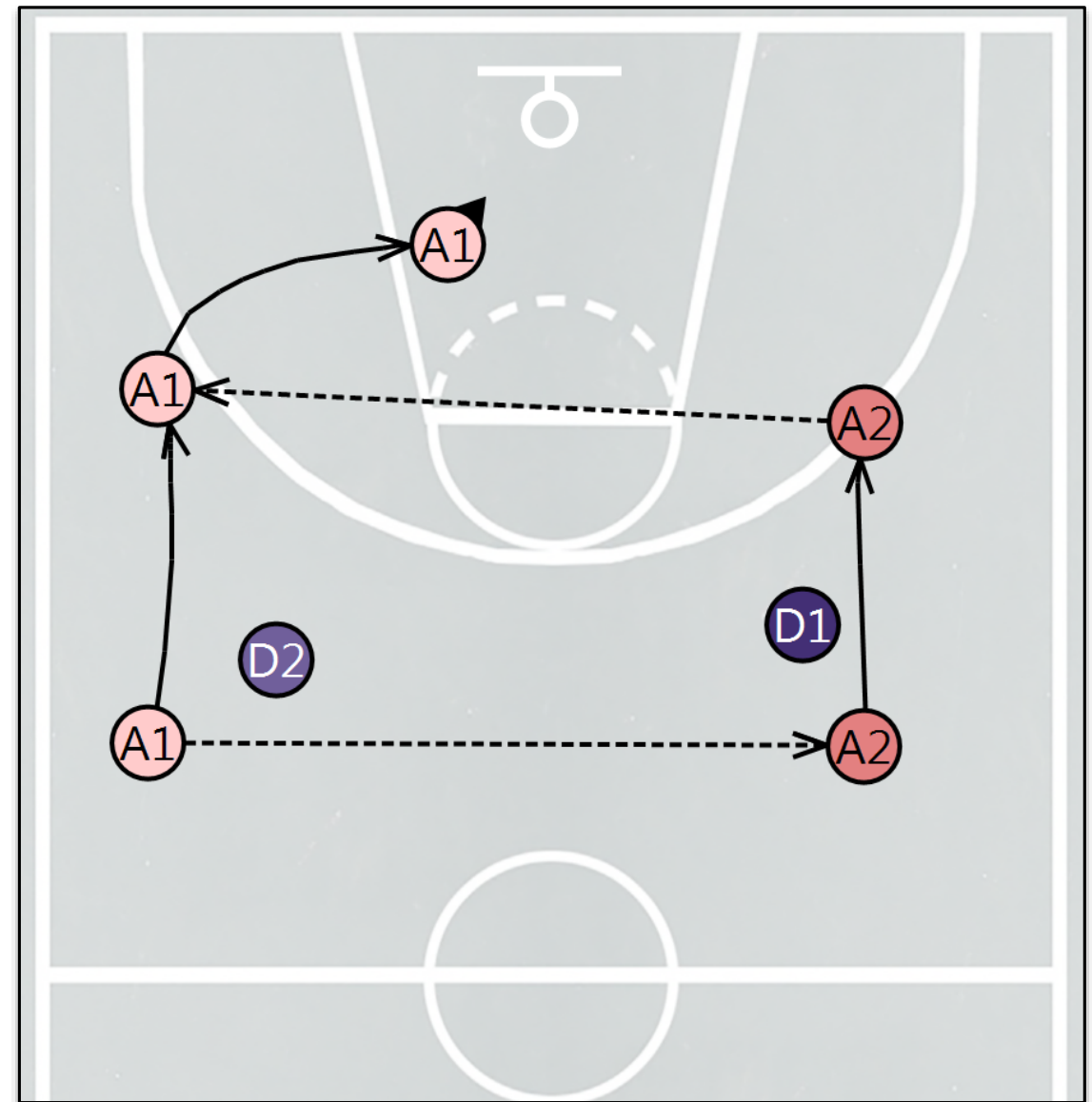
- How do people move?
- Imposed by rules, regulations, habits, emotions,...
- How to describe those rules?

Basketball Scene



Tactics Board

- Positions of players
- Trajectories of players
- Interactions between players
- Abstract, incomplete



Motion Grammar

- Grammars on human movements
- Can describe syntactic structure
- Synthesize structured motion sequences

Semantics

- Measures plausibility of motion with the surrounding
 - Shoot toward the basketball rim
 - Passing players face each other
 - Defenders look at the ball

Evaluation

$$\exp \left(- \sum_{k \in \mathcal{S}(Y)} \frac{f_k}{c_k} - \frac{g_{\text{smooth}}}{w_2} - \frac{g_{\text{collision}}}{w_3} - \frac{g_{\text{effort}}}{w_4} \right)$$

Optimization

- Use MCMC(Markov chain Monte Carlo)
 - Sampling based method
 - Generates a new sample based on the previous sample
 - (One of top ten algorithms of the 20th century)

Results

Screen and Feint