# Domain Adaptation

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CS294-69 – Final Project Proposal

# Problem

- Lots of examples of classes in domain A
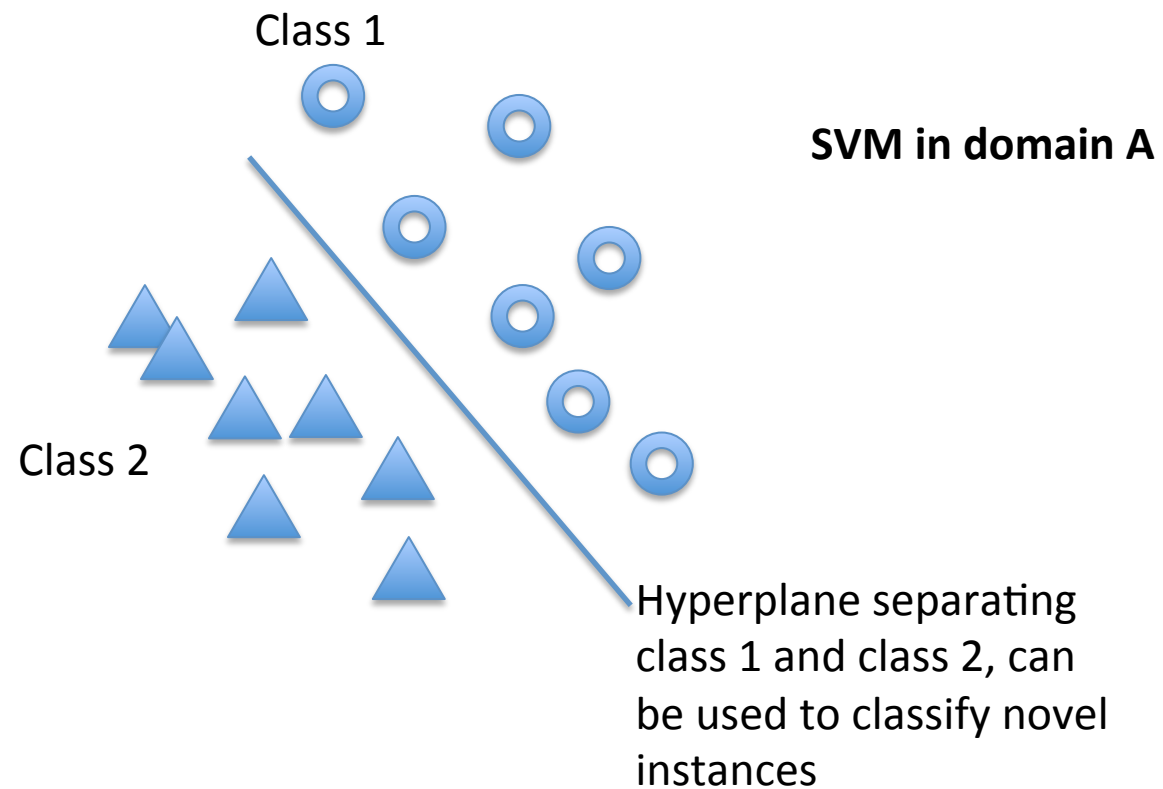


- Few/no examples of same classes in domain B



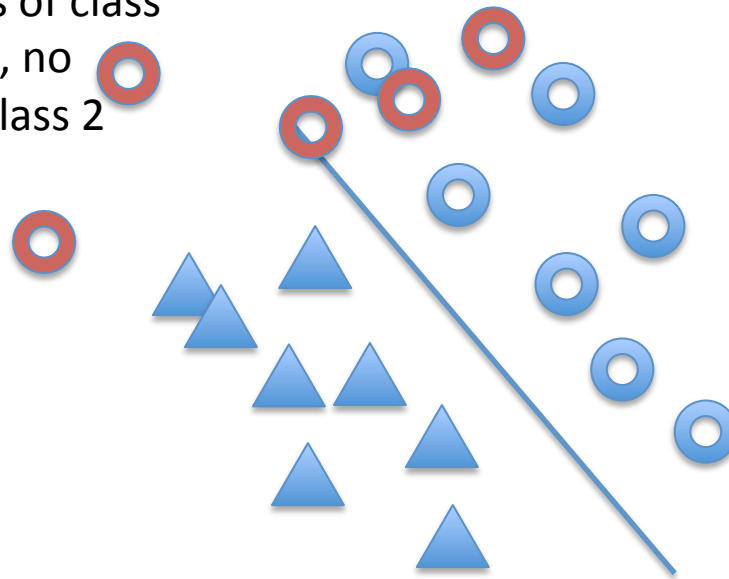- Want to classify in B using knowledge of A

# SVM Method

- Adapt SVM learned in domain A to domain B

Class 1

**SVM in domain A**

Class 2

Hyperplane separating class 1 and class 2, can be used to classify novel instances
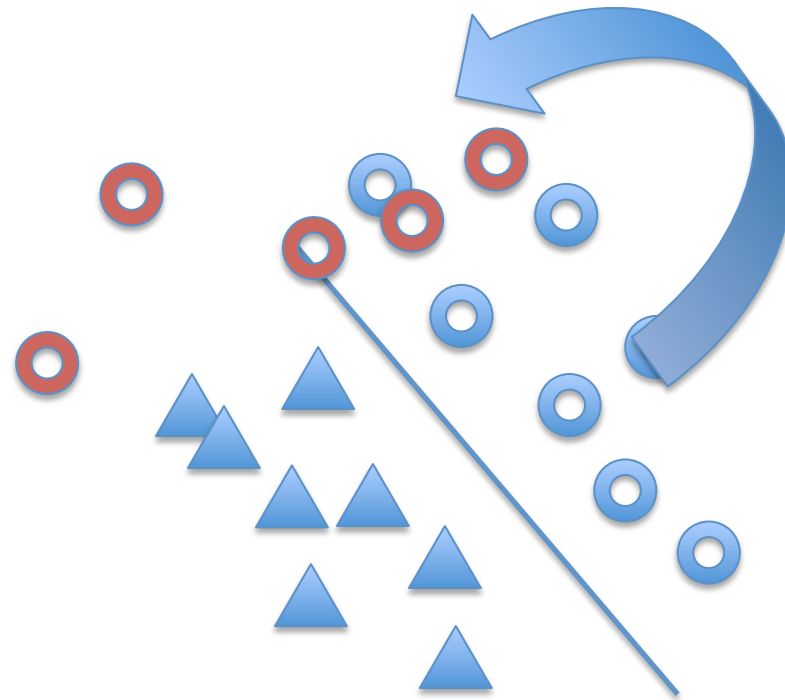
# SVM Method

- Adapt SVM learned in domain A to domain B

Few examples of class 1 in domain B, no examples of class 2

# SVM Method
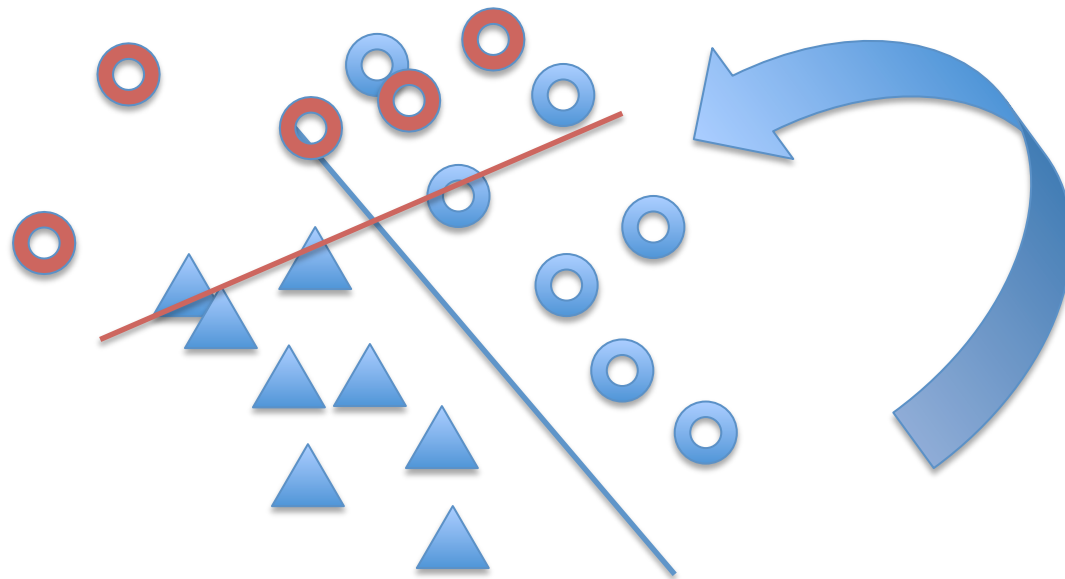
- Adapt SVM learned in domain A to domain B



Learn a transformation between class I from domain A to class I in domain B
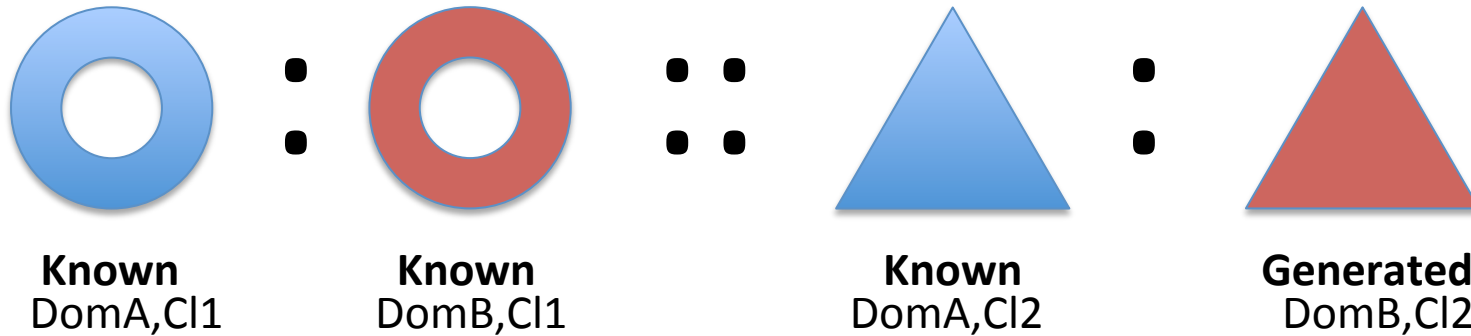
# SVM Method

- Adapt SVM learned in domain A to domain B

Apply transformation to the hyperplane separating classes, giving a hyperplane for domain B separating known class ⭕ and theoretical class 🔺

# Possible New Method

- Use **image analogies [1]** to *generate* examples of novel classes



| **Known** DomA,Cl1 | **Known** DomB,Cl1 | **Known** DomA,Cl2 | **Generated** DomB,Cl2 |

- Could use in combination with SVM transfer learning techniques

[1] Image Analogies. Aaron Hertzmann, Charles E. Jacobs, Nuria Oliver, Brian Curless and David H. Salesin. SIGGRAPH 2001