

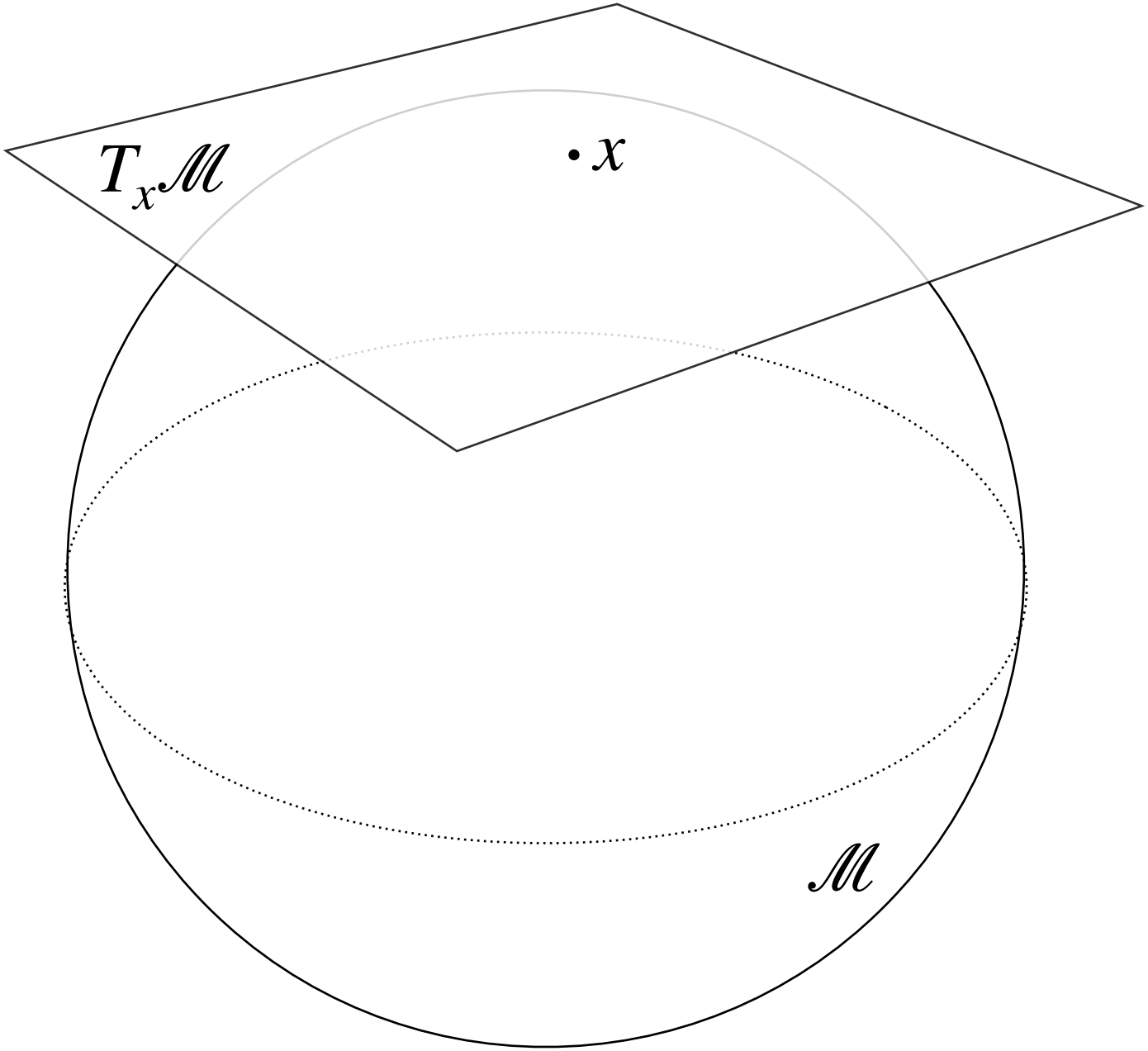




two models

Hyperbolic Neural Networks



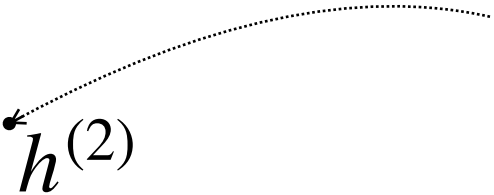




$h^{(1)}$







$h(3)$



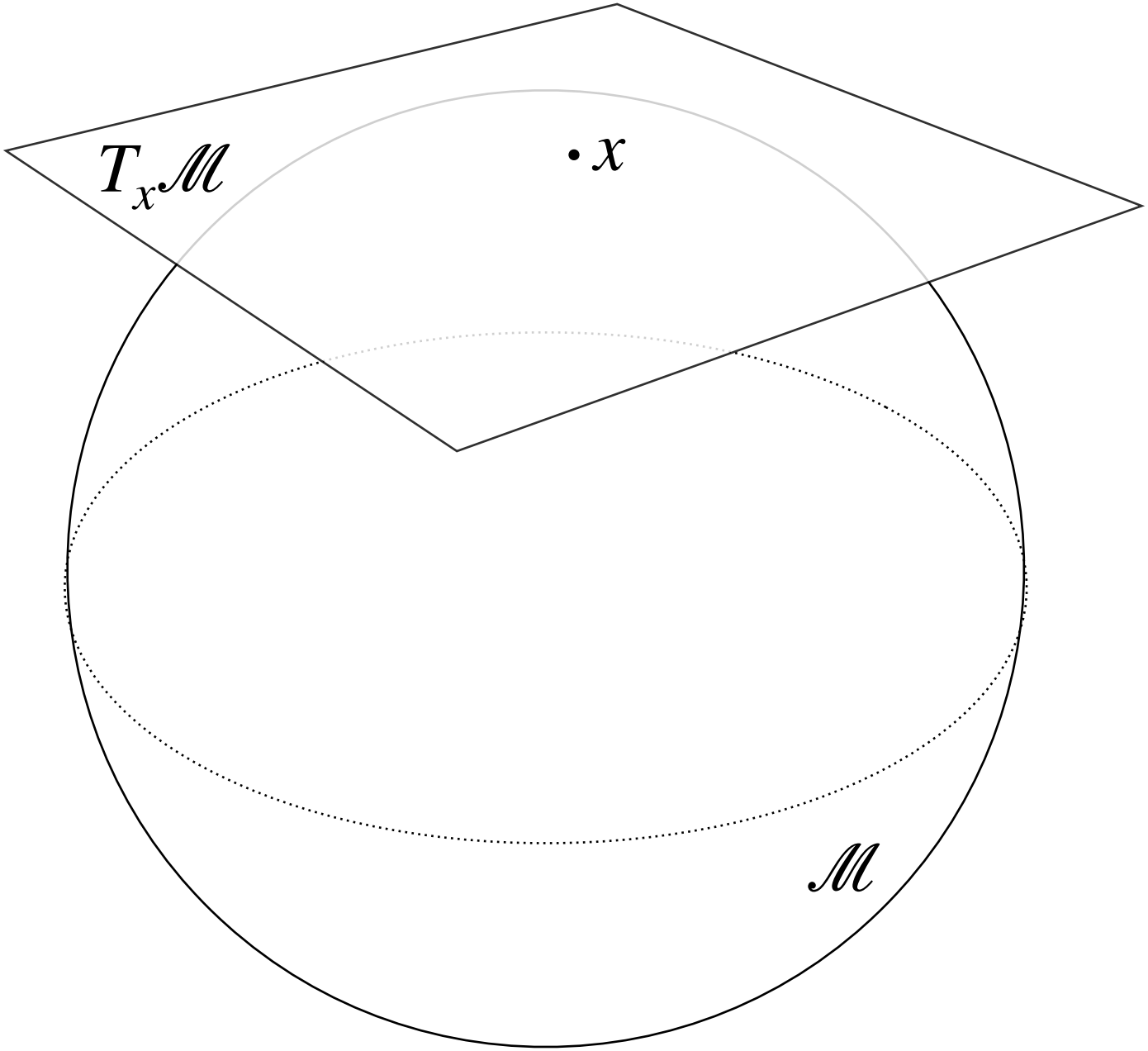


# Hyperbolic Linear Layers

[Ganeva et al. 2018]

# Möbius Layers

[AM, Mroueh, Jaakkola. 2018]

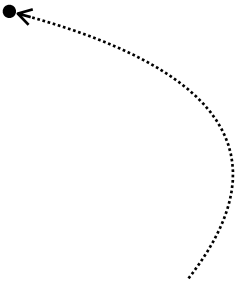


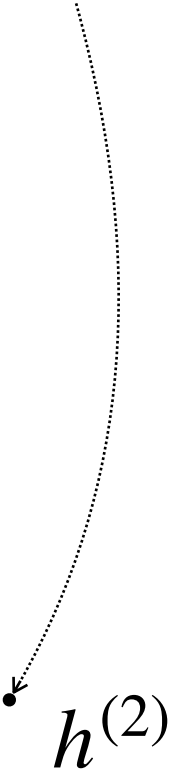


$h^{(1)}$

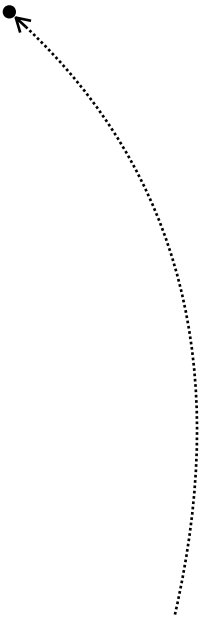
















$$f(\mathbf{x}; \mathbf{W}, \mathbf{b}) \triangleq (\mathbf{W} \otimes \mathbf{x}) \oplus \mathbf{b} = \exp_0(\mathbf{W} \log_0(\mathbf{x})) \oplus \mathbf{b}$$

$$f(\mathbf{x}) \equiv \mathbf{P}(\mathbf{v} \oplus \mathbf{x}) \mathbf{P} \in \mathrm{SO}(d), \mathbf{v} \in \mathbb{D}^d$$



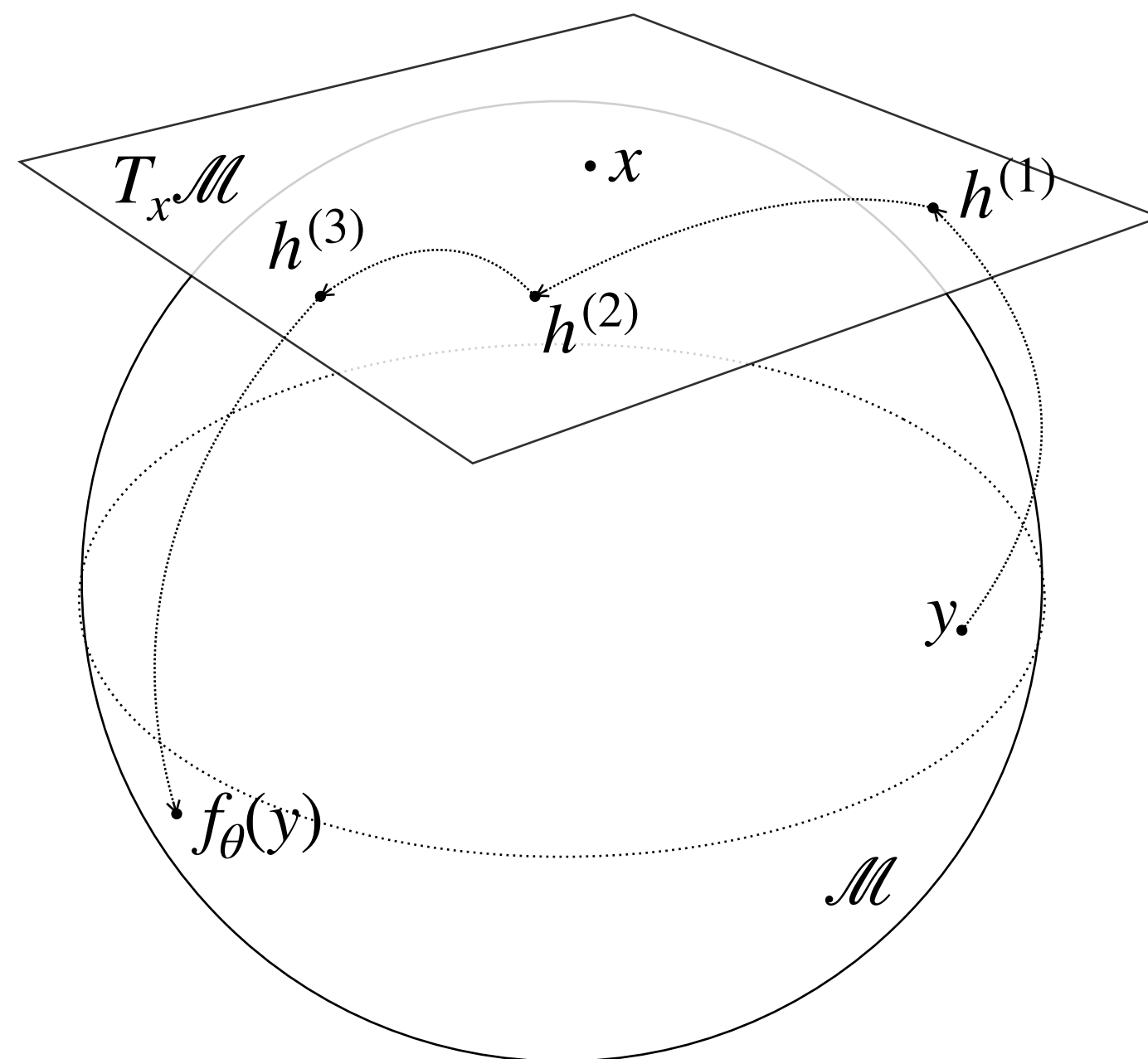
# Hyperbolic Neural Networks

## two models

### Hyperbolic Linear Layers

[Ganea et al. 2018]

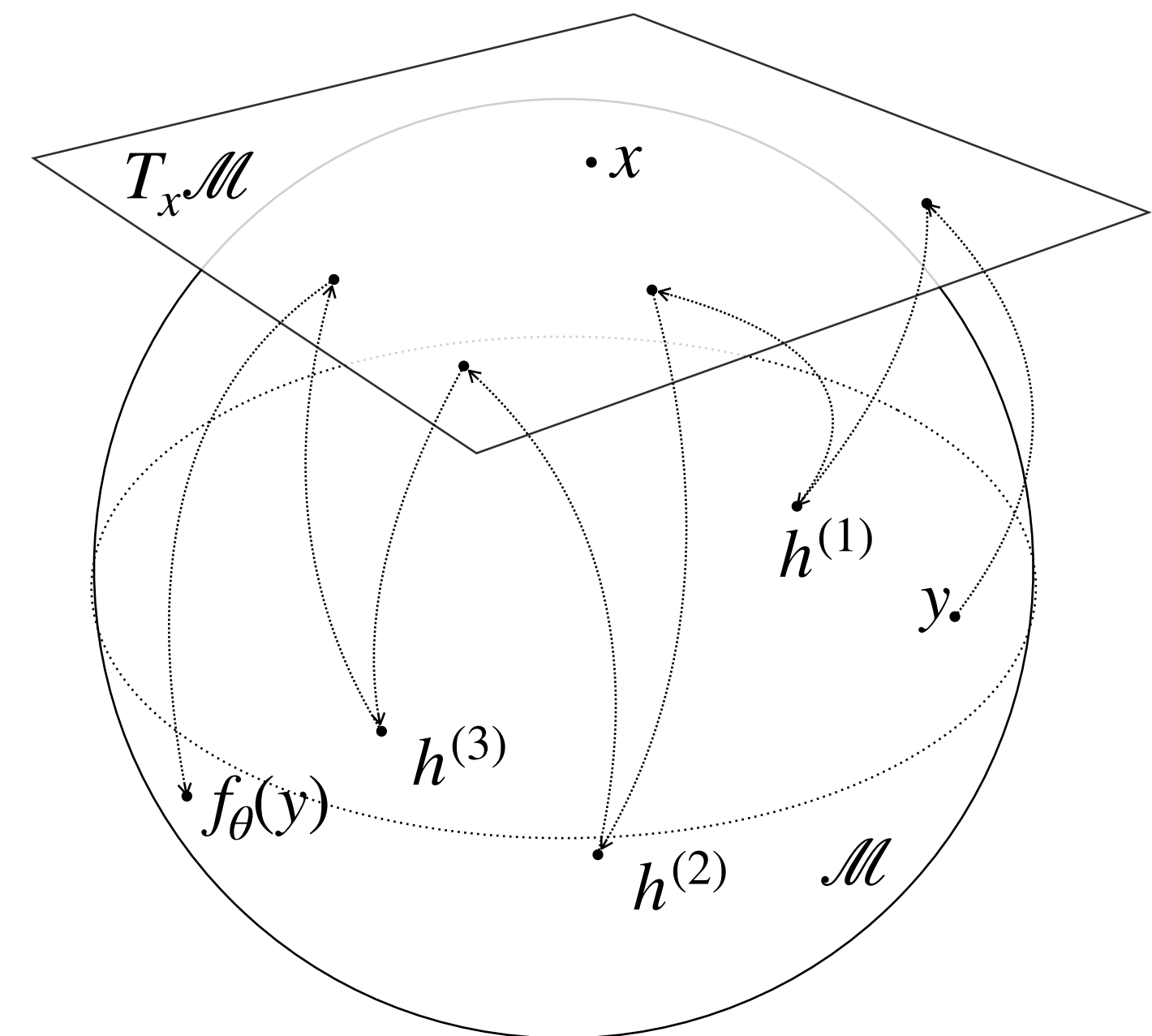
$$f(\mathbf{x}; \mathbf{W}, \mathbf{b}) \triangleq (\mathbf{W} \otimes \mathbf{x}) \oplus \mathbf{b} = \exp_0(\mathbf{W} \log_0(\mathbf{x})) \oplus \mathbf{b}$$



### Möbius Layers

[AM, Mroueh, Jaakkola. 2018]

$$f(\mathbf{x}) = \mathbf{P}(\mathbf{v} \oplus \mathbf{x}) \quad \mathbf{P} \in \text{SO}(d), \mathbf{v} \in \mathbb{D}^d$$



# Interpretability

## Why?

### Domains

Medical

Legal

Loans

AI Research



### Uses

Debugging

Trust in AI

**Fairness**

Oversight

Safety + Security

