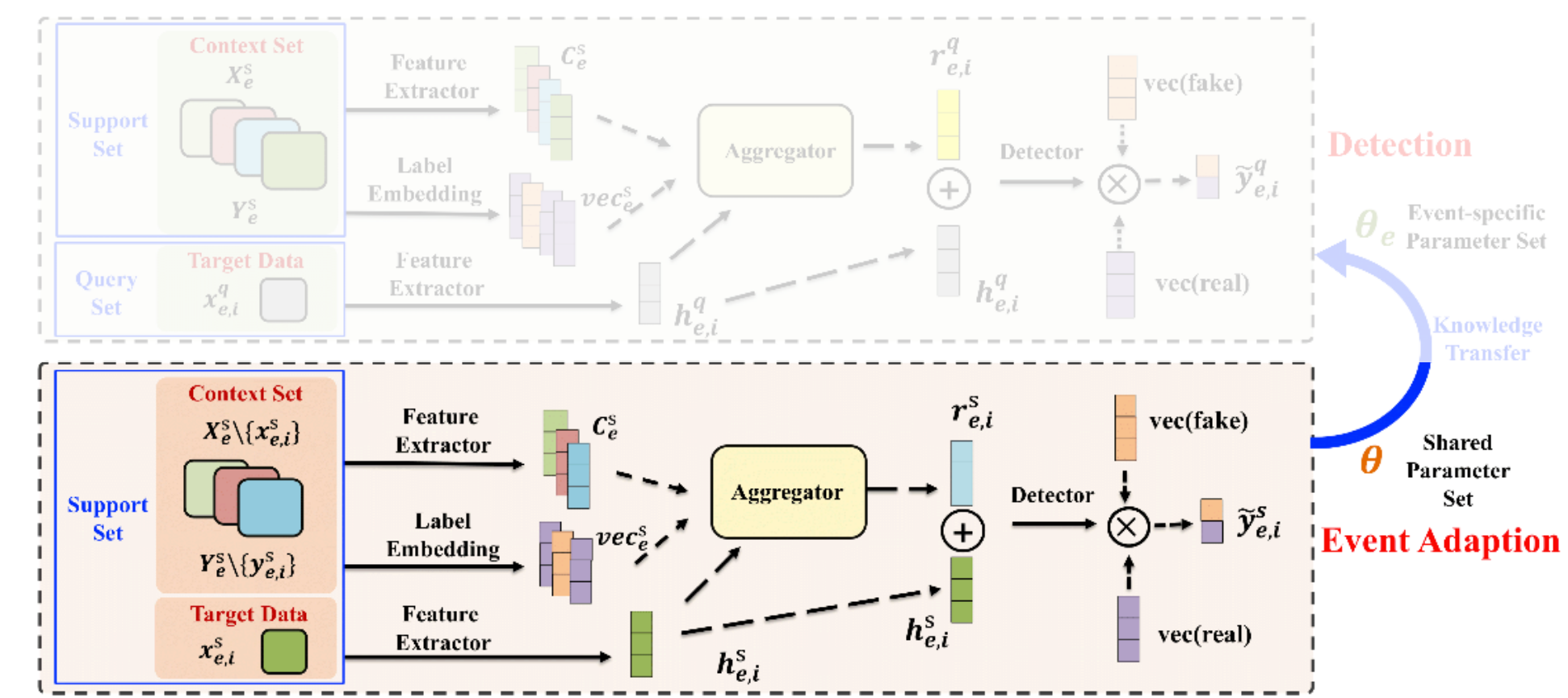# Methodology
Event adaption stage

- The loss can be calculated between the prediction $\hat{y}_{e,i}^{s}$ and the corresponding label $y_{e,i}^{s}$.

- θ: all parameters included in the proposed model.

- The event adaption objective function on the support set can be represented as

$$\mathcal{L}_e^s = \sum_i \log p_\theta \left(y_{e,i}^s \mid \{\mathbf{X}_e^s, Y_e^s\} \backslash \left\{ x_{e,i}^s, y_{e,i}^s \right\}, x_{e,i}^s \right)$$

- Then update parameters θ one gradient descent updates on $\mathcal{L}_e^s$ for event e.

  - $\theta_e = \theta - \alpha \nabla_\theta \mathcal{L}_e^s$

Methodology
Detection stage
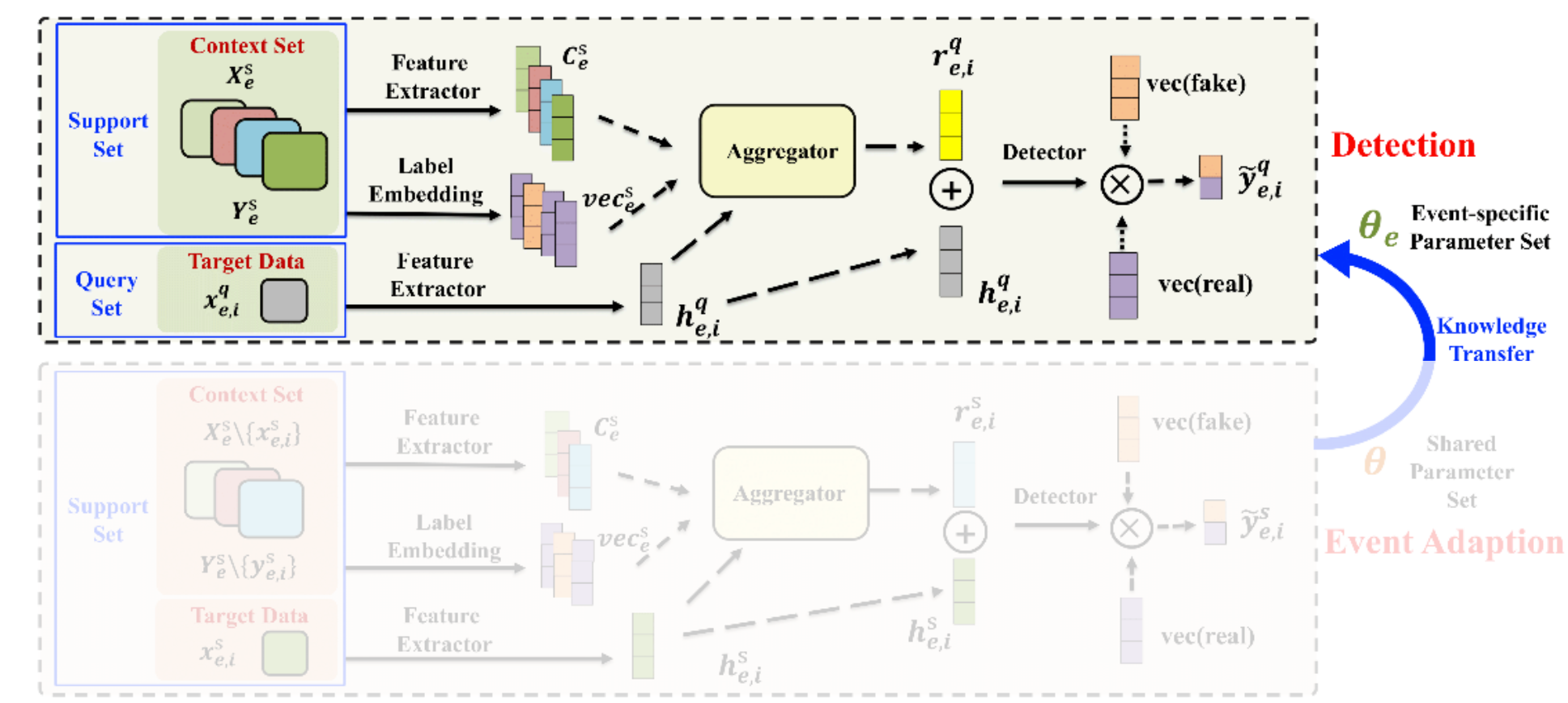
- The proposed model with event-specific parameter set θ_e takes query set $\mathbf{X}_e^q$ and entire support set $\{\mathbf{X}_e^s, \mathbf{Y}_e^s\}$ as input and outputs predictions $\hat{\mathbf{Y}}_e^q$ for query set $\mathbf{X}_e^q$.

- The loss function in the detection stage can be represented as

  - $$\mathscr{L}_e^q = \log p_{\theta_e}\left(Y_e^q \mid X_e^s, Y_e^s, X_e^q\right)$$

- Through this meta neural process, we can learn an initialization parameter set θ which can rapidly learn to use given context input-outputs as conditioning to detect fake news on newly arrived events.