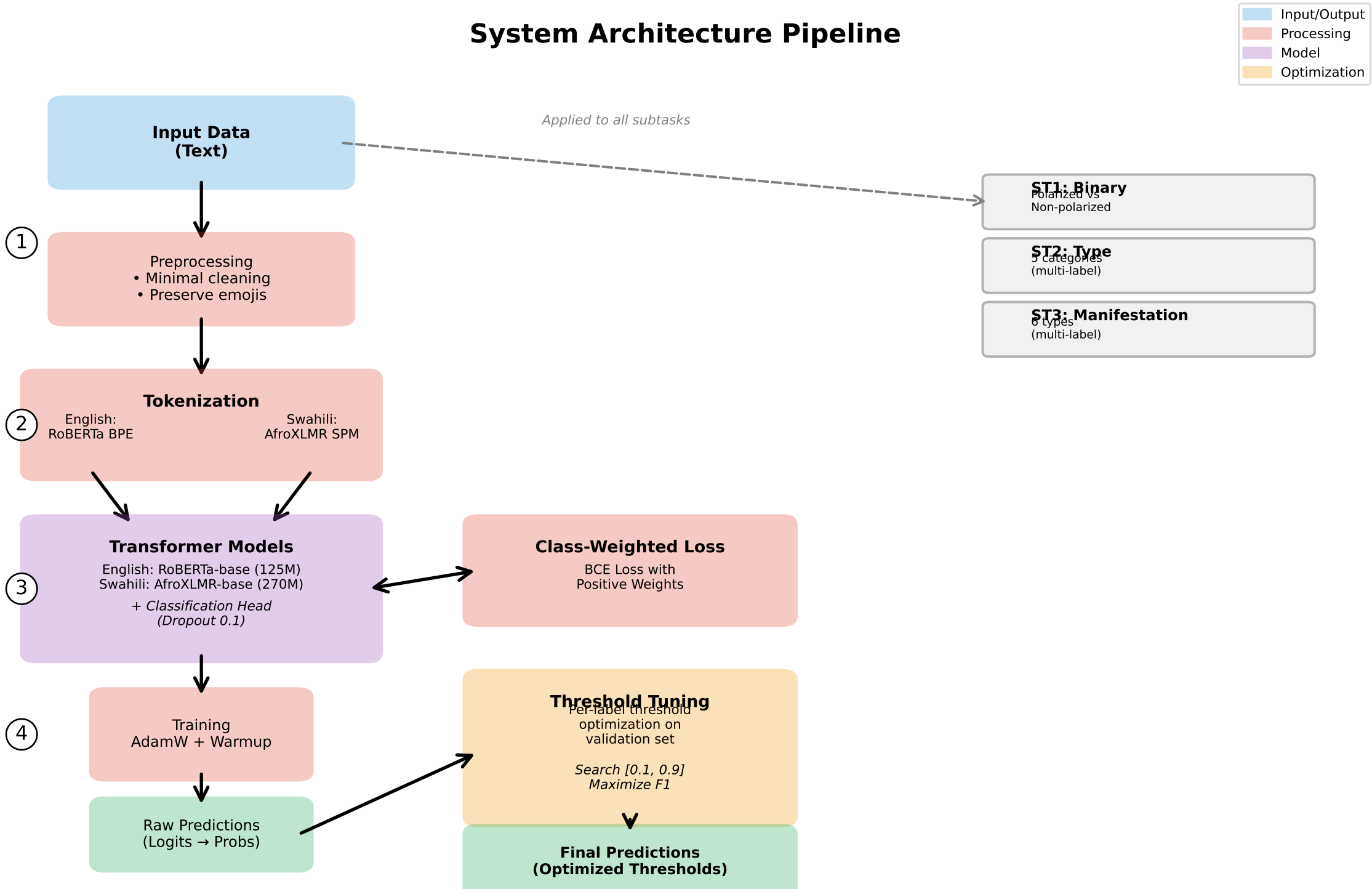
System Architecture Pipeline
Input/Output
Processing
Model
Optimization
Input Data
(Text)
Applied to all subtasks
ST1: Binary
Polarized vs
Non-polarized
ST2: Type
3 categories
(multi-label)
ST3: Manifestation
6 types
(multi-label)
1
Preprocessing
• Minimal cleaning
• Preserve emojis
2
Tokenization
English:
RoBERTa BPE
Swahili:
AfroXLMR SPM
3
Transformer Models
English: RoBERTa-base (125M)
Swahili: AfroXLMR-base (270M)
+ Classification Head
(Dropout 0.1)
Class-Weighted Loss
BCE Loss with
Positive Weights
4
Training
AdamW + Warmup
Raw Predictions
(Logits → Probs)
Threshold Tuning
Per-label threshold
optimization on
validation set
Search [0.1, 0.9]
Maximize F1
Final Predictions
(Optimized Thresholds)