

## Error Type Taxonomy

### JAB ERRORS

Error Code	Description
dropped_elbow	Elbow drops below shoulder line during extension
no_hip_rotation	Hips remain square to target (less than 10 degrees rotation)
overextended	Punch travels past optimal range (elbow locks out)
poor_stance	Weight not shifted to front foot at impact
slow_retraction	Fist does not snap back to guard position

### CROSS ERRORS

Error Code	Description
no_hip_drive	Rear hip does not rotate forward (less than 30 degrees)
dropped_rear_hand	Guard hand drops below chin level during punch
straight_back_leg	Rear leg does not pivot (heel stays flat on ground)
head_forward	Chin moves ahead of centerline (neck angle less than 15 degrees)

weak_followthrough	Punch stops at extension without hip drive completion
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### Phase 1 Data Targets (Weeks 1-5)

Category	Target
<b>Expert Reference Clips:</b>	20+ videos (10 jab, 10 cross, perfect form)
<b>Beginner Error Clips:</b>	100+ videos (50 jab errors, 50 cross errors, labeled)
<b>Annotated Frames:</b>	2000+ frames with keypoint labels (12 joints minimum)