

Should We Discuss About This Patches?

- Case Study of Open Source Projects -

Akinori Ihara, Ken-ichi Matsumoto (Nara Institute of Science and Technology, Japan)
Shane McIntosh and Ahmed E. Hassan (Queen's University)

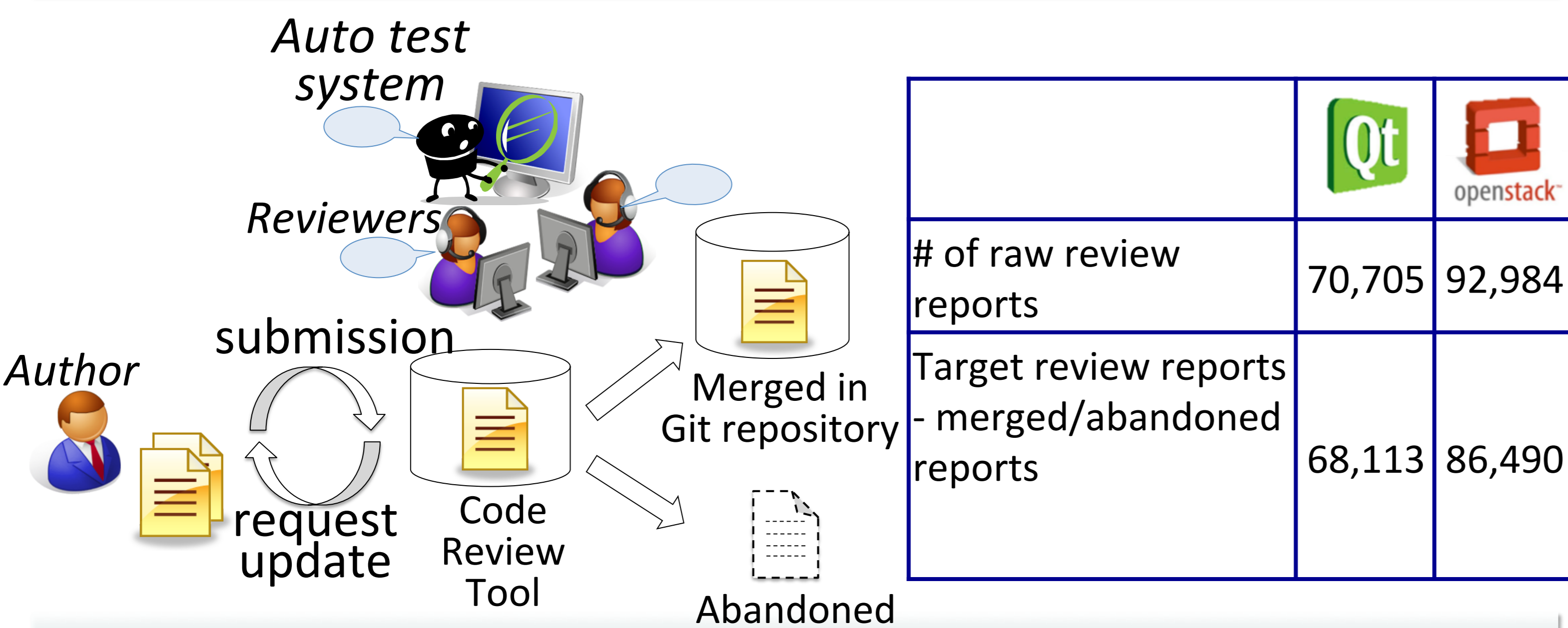
Background

60-90 patches are submitted to OSS projects daily



Goal: Identifying patches that is confusing reviewers

Data Setting



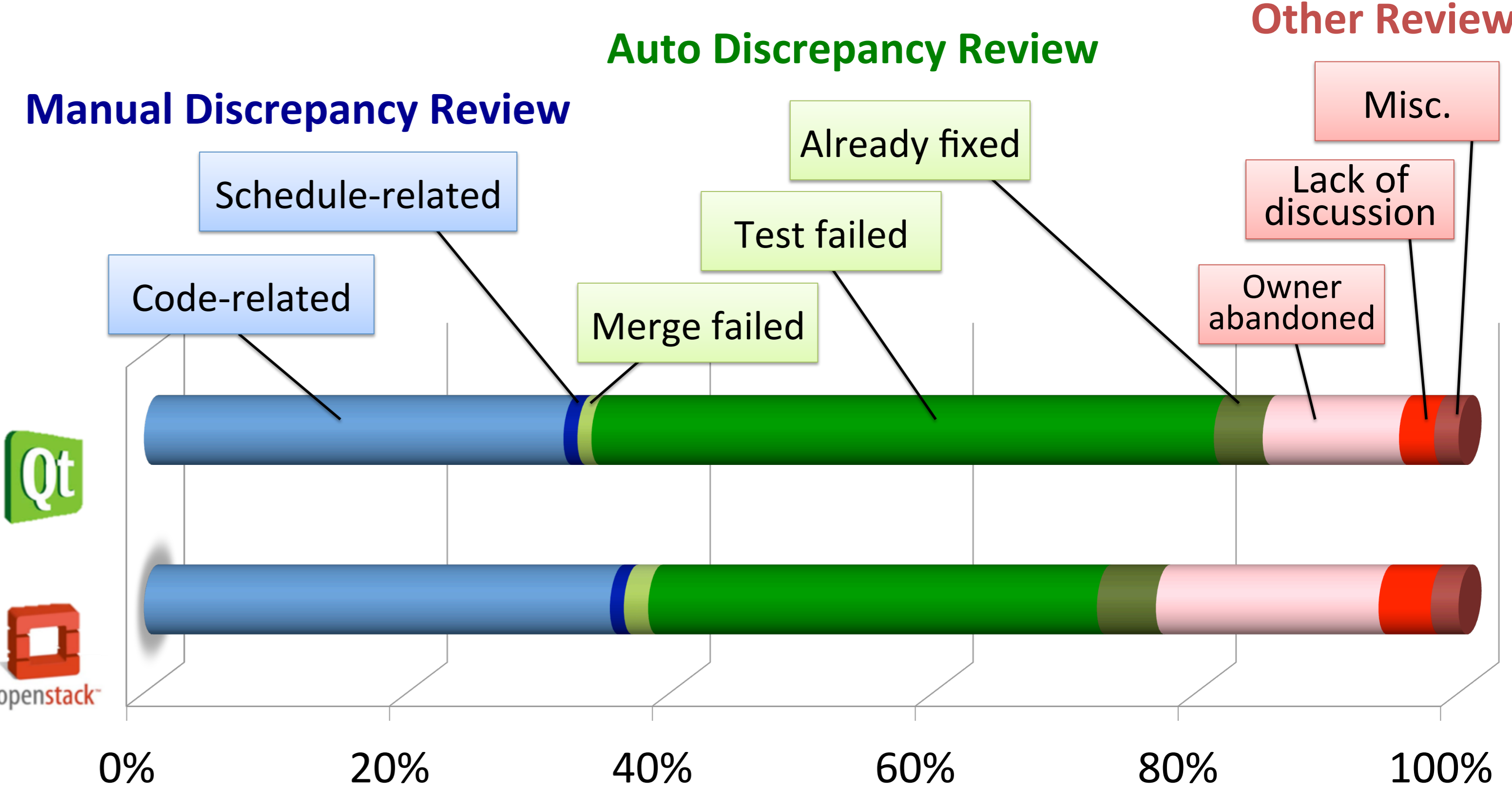
Review Agreement Pattern

Qt project	Reviewed by more than 2						Reviewed by only 1	
	Consensus		Discrepancy			Merged	Abandoned	
	Merged	Abandoned	Resolved	Merged	Not resolved			
Pattern	Pattern A	Pattern B	Pattern C	Pattern D	Pattern E	Pattern F	Pattern G	
	Consensus-review		Discrepancy-review			Solo-review		
# reviews	45,861 (67.3%)	1,046 (1.5%)	8,346 (12.3%)	4,131 (6.1%)	7,911 (11.6%)	559 (0.8%)	259 (0.4%)	
# files	1	4	2	3	2	1	2	
# voters	3	2	3	3	3	1	1	
# communicators	4	2	4	5	3	1	1	
# comments	5	3	13	13	4	2	1	
Time (days)	0.5	3.8	2.8	2.8	2.1	0.0	0.0	
% positive (med)	100%	0%	100%	67%	50%	100%	0%	
% negative (med)	0%	100%	0%	33%	50%	0%	100%	
OpenStack project	Consensus-review		Discrepancy-review			Solo-review		
# reviews	61,356 (70.9%)	106 (0.1%)	6,039 (7.0%)	2,131 (2.5%)	11,451 (13.2%)	1,409 (1.6%)	4,057 (4.7%)	
# files	2	2	3	4	2	2	2	
# voters	4	2	5	6	3	1	1	
# communicators	4	3	7	8	5	4	2	
# comments	10	4	23	32	5	13	3	
Time (days)	1.3	5.8	10.9	10.2	9.3	1.6	0.2	
% positive (med)	100%	0%	100%	83%	50%	100%	0%	
% no score (med)	0%	0%	0%	17%	0%	0%	0%	
% negative (med)	0%	100%	0%	0%	33%	0%	100%	

No-consensus patches are longer review time, more discussion!

Reasons of Discrepancy Review

Read 377 review reports manually each project



30% rejected patches were not detected automatically

Manual Discrepancy Review Prediction

Review report

- Description length
- New function or Bug
- Submitted Time

Owner experience

- #patch #comment
- %consensus

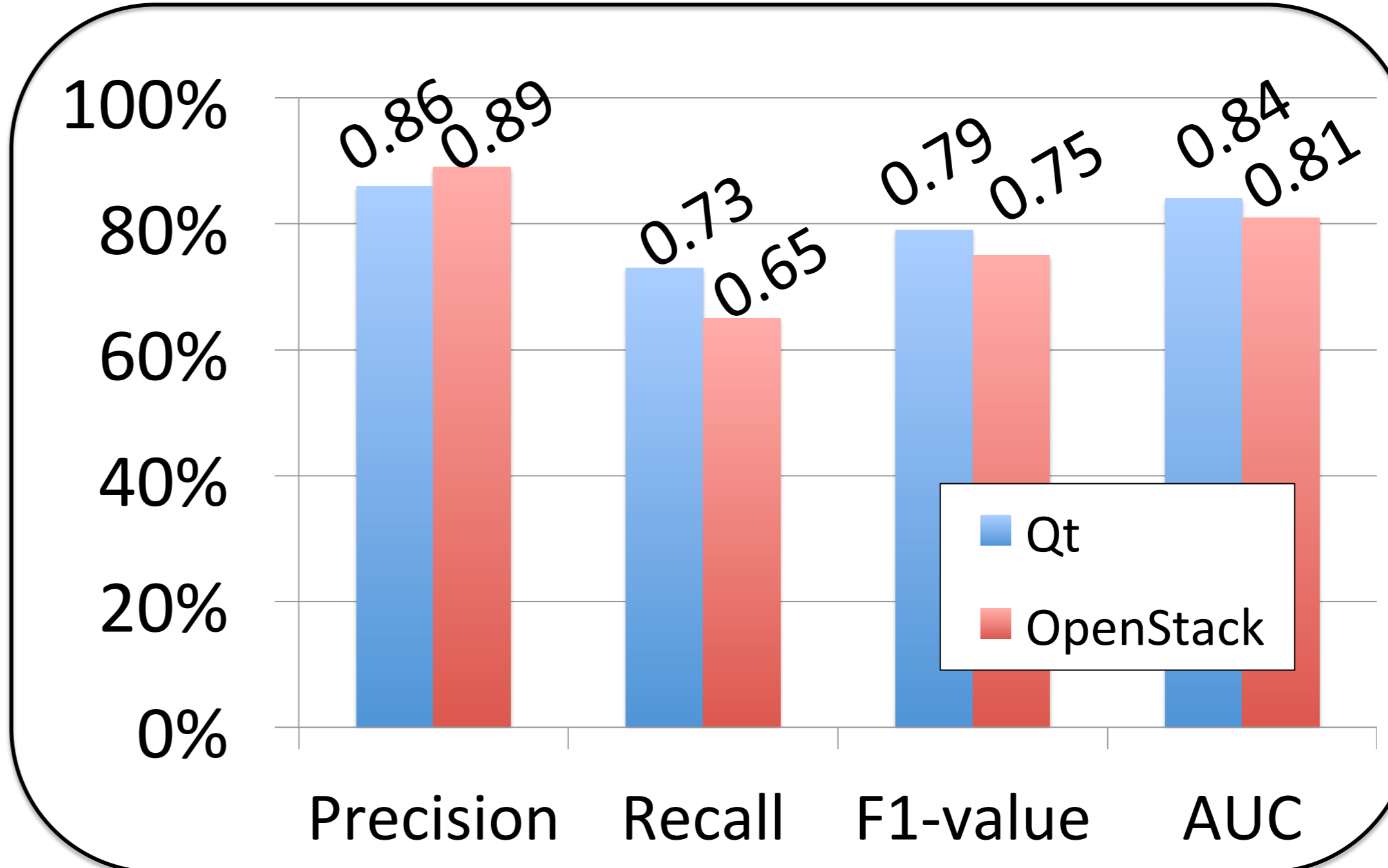
Patches

- Churn
- #Subsystem
- #Component

#manual discrepancy review

Qt (30.0%)
20,388 / 68,113

openstack (22.6%)
19,595 / 86,549



Top important factors to predict manual discrepancy reviews

rank	Qt	OpenStack
1	# Comments	# Patches
2	# Patches	# Comments
3	% Consensus reviews by Owner	% Consensus reviews by Owner
		# Added Lines
		# Changed lines

Owner's experience is more important!