



Bayesian Modeling for Software Quality

By

Mohammad Sharif Hanif

Department of Computer Science

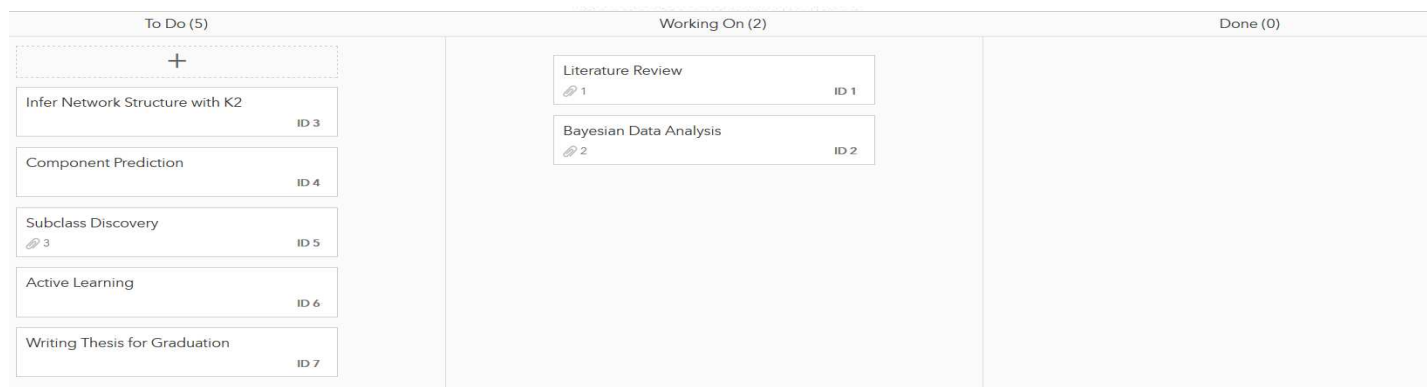
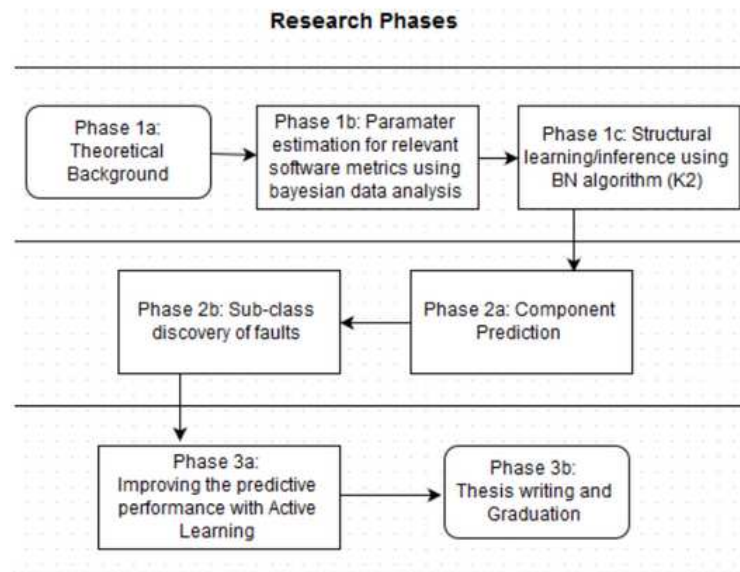
Brunel University London

30 March 2015

Today's agenda

- PhD plan
- Research Progress
- Next Step
- Project timetable
- Admin matters
- Next meeting

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting



PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

| defect-reports.arff | | | | | | | | | |
|--------------------------|----------|---|----------|-------------|---------------------------|---|-------------|--|--|
| Relation: defect-reports | | | | | | | | | |
| No. | id | description | priority | project | project_name | title | type | | |
| | Nominal | String | Nominal | String | String | String | Nominal | | |
| 25917 | 283308.0 | A tab for the jmx console that grabs information fro... | Major | FELIX | Felix | A graphical tab to remotely get memory activity | New Feature | | |
| 25916 | 283307.0 | This MBean / Graphical couple is able to remotely in... | Major | FELIX | Felix | A graphical tab to remotely interact with obr | New Feature | | |
| 13068 | 135171.0 | We need a .gitignore file under nutch/ so git does no... | Trivial | NUTCH | Nutch | A .gitignore file for Nutch | Improvement | | |
| 4289 | 60889.0 | Should be work with JSP and Facelets | Major | | MyFaces Tobago | A Bean-Tag or CRUD-Tag to create dynamic pages with low effort | New Feature | | |
| 47466 | 501275.0 | try examination example with exam set 2: after initia... | Major | PLANNER | OptaPlanner | A BestSolutionChangedEvent should be fired when a StartingSolutionInit... | Bug | | |
| 28177 | 308725.0 | Several people have asked if ManifoldCF supports C... | Major | CONNECTO... | ManifoldCF | A CMIS connector would be helpful | New Feature | | |
| 6851 | 85882.0 | This bug is a little symmetric of SMXCOMP-446 (a CXF... | Major | | ServiceMix Components | A CXF-BC provider used with WS-RM sends the CreateSequence request ... | Bug | | |
| 6721 | 84487.0 | Clob cannot be directly be consumed by Solr. So Jdb... | Minor | SOLR | Solr | A Clobtransformer to read strings from Clob | Improvement | | |
| 6353 | 80795.0 | This means you cant try and create the collection ag... | Major | SOLR | Solr | A Collection that is only partially created and then deleted will leave pre ... | Bug | | |
| 39189 | 416166.0 | There should be a standard converter for java.util.C... | Minor | XSTR | XStream | A Currency converter | Improvement | | |
| 1246 | 32119.0 | A DIV tag that utilized Ajax to obtain its contents. S... | Major | | Struts 2 | A DIV tag that utilized Ajax to obtain its contents | New Feature | | |
| 19412 | 197278.0 | See the following comment for detailed description. | Major | | Hadoop HDFS | A Distributed and Cooperative NameNode Cluster for a Highly-Available ... | New Feature | | |
| 1820 | 38999.0 | A few of the projects were missing site.xml site desc... | Minor | WICKET | Wicket | A Few Wicket Projects are Missing site.xml and wicket-site-skin | Bug | | |
| 51153 | 556158.0 | I have attached a patch that provides a Gradle build | Major | GROOVY | groovy | A Gradle build for Groovy | New Feature | | |
| 52532 | 575089.0 | See JBSEAM-4276.Patch proposed in JBSEAM-4276 I... | Blocker | | JBoss Enterprise Appli... | JBOS generated WAR project with reverse-engineered entities doesnt ... | Bug | | |
| 58047 | 645660.0 | A patch proposed in JBSEAM-4276 is not applied int... | Blocker | | Developer Studio (JBo... | JBOS generated WAR project with reverse-engineered entities doesnt ... | Bug | | |
| 38880 | 413151.0 | A JobExecution does not need a start time until it ac... | Minor | | Spring Batch | A JobExecution does not need a start time until it actually starts | Bug | | |
| 49068 | 523929.0 | Non-leaf nodes shouldnt have a layerinfo component... | Major | MAPFACES | MapFaces | A LayerInfo component is added even if the node is not a leaf | Bug | | |
| 7074 | 88685.0 | It would be useful if service-mix provided a store im... | Major | | ServiceMix | A MongoDB Store would be usefull | New Feature | | |
| 6404 | 81524.0 | Id like to fix this for 4 - its a simple fix. | Blocker | SOLR | Solr | A PeerSync attempt to its replicas by a candidate leader should not fail o... | Bug | | |
| 5323 | 26707.0 | We could do a reference implementation of the Load... | Major | STRATOS | Stratos | A Reference Load Balancer Extension API Implementation for HAProxy | Sub-task | | |
| 40133 | 425190.0 | A Registry of projects should be maintained. Curren... | Major | UDIG | UDIG | A Registry of projects should be maintained. | Bug | | |
| 6730 | 84550.0 | This is same as SOLR-139. A new issue is opened so... | Major | SOLR | Solr | A RequestProcessor to support updates | New Feature | | |
| 35550 | 376598.0 | We need to resolve this issue. Major case | Major | ABDERA | Abdera | A Runtime Exception Problem | Bug | | |
| 33218 | 359243.0 | A SOAP 1.2 Message with a SWARef attachment is d... | Major | AXIOM | Axiom | A SOAP 1.2 SWARef Message is denied | Bug | | |
| 42515 | 443376.0 | see attached screenshot. There should be a cache so... | Major | SONAR | SonarQube | A SQL Select Query is done on Rules table each time a new violation is s... | Improvement | | |
| 55096 | 608707.0 | The simple plugin tutorial has not been updated for... | Minor | GEOS | GeoServer | A Simple Plugin tutorial is not available in the new docs for geoserver ve... | Improvement | | |
| 6501 | 82590.0 | This is starting to really bug me because tests almos... | Major | SOLR | Solr | A SolrIndexSearcher can be left open if the executor rejects a task. | Bug | | |
| 36588 | 380099.0 | It could be useful if a state can extend more than on... | Minor | | Spring Web Flow | A State should be able to extend more than one states | Improvement | | |
| 32198 | 347338.0 | The web application we are building in this tutorial ... | Trivial | BEEHIVE | Beehive | A Typo in tutorial_pageflow.html | Bug | | |
| 19000 | 195423.0 | A UDF that can export data to JDBC databases. | Minor | HIVE | Hive | A UDF that can export data to JDBC databases. | New Feature | | |
| 59731 | 668913.0 | Because of new class hierarchy and co-variant return... | Blocker | ISPN | Infinispan | A Weld upgrade is needed | Bug | | |
| 4290 | 60890.0 | Should be work with JSP and Facelets. | Major | MYFACES | MyFaces Tobago | A Wizard-Tag to create dynamic wizard pages with low effort | New Feature | | |
| 2059 | 41215.0 | It probably would make sense to have a Set of "Attri... | Minor | VYSPER | VYSPER | A XMLElement might have duplicate attributes which isnt allowed in XML | Bug | | |

(bug_count / project_count) *
(blocker_count + critical_count)

QI > 5 = 1 = risky
QI < 5 = 0 = safe

ckjm — Chidamber and Kemerer Java Metrics

www.spinellis.gr/sw/ckjm/

| Relation: defect-metrics | | | | | | | | | | | | | | | | | | |
|--------------------------|-------------|---------------|-----------|-------------------|-------------------|----------------|---------------|----------------|-------------|-------------|---------------|---------|---------|---------|---------|---------|---------|---------|
| No. | name | project_count | bug_count | new_feature_count | improvement_count | sub_task_count | blocker_count | critical_count | major_count | minor_count | trivial_count | NOC | WMC | CBO | RFC | LCOM | Ca | Ce |
| | String | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal | Nominal |
| 1 | CXF | 389.0 | 167.0 | 26.0 | 116.0 | 20.0 | 0.0 | 4.0 | 312.0 | 65.0 | 8.0 | 173... | 3.93 | 3.45 | 10.6 | 24.04 | 1.69 | 1.93 |
| 2 | HBASE | 1126.0 | 471.0 | 47.0 | 289.0 | 132.0 | 90.0 | 66.0 | 699.0 | 217.0 | 94.0 | 402... | 3.95 | 5.13 | 12.22 | 37.91 | 2.58 | 2.82 |
| 3 | KARAF | 316.0 | 100.0 | 25.0 | 88.0 | 15.0 | 6.0 | 5.0 | 271.0 | 29.0 | 5.0 | 328.0 | 2.84 | 1.74 | 7.68 | 14.57 | 0.96 | 0.5 |
| 4 | SONAR | 577.0 | 124.0 | 69.0 | 304.0 | 22.0 | 1.0 | 17.0 | 417.0 | 126.0 | 16.0 | 194.0 | 4.27 | 2.01 | 10.3 | 94.42 | 1.08 | 1.08 |
| 5 | JBPM | 447.0 | 117.0 | 0.0 | 47.0 | 17.0 | 5.0 | 15.0 | 366.0 | 46.0 | 1.0 | 178.0 | 2.92 | 4.48 | 12.61 | 8.19 | 0.99 | 3.51 |
| 6 | FABRICTHREE | 209.0 | 70.0 | 87.0 | 1.0 | 1.0 | 17.0 | 11.0 | 160.0 | 29.0 | 2.0 | 544.0 | 4.27 | 4.48 | 9.25 | 5.57 | 0.82 | 3.75 |
| 7 | NUTCH | 250.0 | 67.0 | 30.0 | 96.0 | 35.0 | 1.0 | 5.0 | 128.0 | 87.0 | 29.0 | 534.0 | 3.17 | 5.42 | 13.41 | 7.63 | 1.48 | 4.06 |
| 8 | CMIS | 121.0 | 41.0 | 14.0 | 39.0 | 9.0 | 1.0 | 4.0 | 79.0 | 36.0 | 1.0 | 908.0 | 4.61 | 3.35 | 10.51 | 106.48 | 1.15 | 2.29 |
| 9 | PIG | 336.0 | 148.0 | 40.0 | 89.0 | 28.0 | 8.0 | 11.0 | 265.0 | 38.0 | 14.0 | 466.0 | 2.59 | 3.73 | 10.46 | 7.03 | 0.42 | 3.35 |
| 10 | OPENEJB | 201.0 | 72.0 | 206.0 | 43.0 | 93.0 | 2.0 | 1.0 | 258.0 | 28.0 | 2.0 | 166... | 3.34 | 3.78 | 11.33 | 18.68 | 1.65 | 2.24 |
| 11 | OPENNLP | 233.0 | 33.0 | 17.0 | 123.0 | 3.0 | 0.0 | 0.0 | 117.0 | 108.0 | 8.0 | 744.0 | 2.83 | 4.43 | 9.51 | 8.83 | 2.1 | 2.4 |
| 12 | JBURULES | 376.0 | 127.0 | 0.0 | 0.0 | 12.0 | 5.0 | 16.0 | 325.0 | 25.0 | 2.0 | 387... | 6.1 | 6.72 | 12.95 | 80.91 | 2.91 | 4.02 |
| 13 | ARO | 215.0 | 40.0 | 0.0 | 0.0 | 3.0 | 2.0 | 10.0 | 171.0 | 27.0 | 1.0 | 670... | 3.9 | 6.04 | 9.25 | 40.67 | 3.13 | 3.18 |
| 14 | MILYN | 127.0 | 30.0 | 35.0 | 27.0 | 10.0 | 3.0 | 2.0 | 106.0 | 15.0 | 1.0 | 154... | 3.14 | 4.75 | 10.8 | 8.17 | 1.56 | 3.36 |
| 15 | COCOON | 101.0 | 36.0 | 6.0 | 22.0 | 6.0 | 1.0 | 3.0 | 73.0 | 22.0 | 2.0 | 234.0 | 3.88 | 3.68 | 12.84 | 19.43 | 0.85 | 3.18 |
| 16 | AVRO | 206.0 | 65.0 | 45.0 | 77.0 | 5.0 | 7.0 | 2.0 | 158.0 | 34.0 | 5.0 | 358.0 | 3.61 | 3.34 | 9.39 | 16.23 | 1.74 | 1.86 |
| 17 | BOOKKEEPER | 209.0 | 82.0 | 14.0 | 57.0 | 45.0 | 11.0 | 3.0 | 153.0 | 36.0 | 6.0 | 272... | 4.78 | 4.51 | 9.95 | 59.14 | 2.38 | 2.63 |
| 18 | MAHOUT | 234.0 | 72.0 | 16.0 | 65.0 | 6.0 | 0.0 | 0.0 | 88.0 | 54.0 | 5.0 | 176... | 3.14 | 4.75 | 10.8 | 8.17 | 1.56 | 3.36 |
| 19 | SHINDIG | 214.0 | 88.0 | 25.0 | 79.0 | 7.0 | 3.0 | 2.0 | 146.0 | 24.0 | 9.0 | 448.0 | 2.73 | 2.77 | 8.07 | 8.81 | 1.04 | 1.89 |
| 20 | SOOOP | 228.0 | 66.0 | 30.0 | 53.0 | 45.0 | 11.0 | 3.0 | 171.0 | 26.0 | 17.0 | 950.0 | 2.79 | 3.7 | 9.95 | 36.08 | 1.27 | 2.49 |
| 21 | ISPN | 414.0 | 126.0 | 0.0 | 0.0 | 10.0 | 21.0 | 23.0 | 307.0 | 54.0 | 6.0 | 238... | 4.72 | 6.01 | 11.42 | 73.24 | 3.0 | 3.4 |
| 22 | OPID | 734.0 | 326.0 | 65.0 | 242.0 | 31.0 | 16.0 | 9.0 | 530.0 | 159.0 | 20.0 | 544.0 | 5.05 | 4.69 | 13.25 | 77.9 | 1.68 | 3.33 |
| 23 | SWITCHYARD | 390.0 | 104.0 | 0.0 | 0.0 | 17.0 | 18.0 | 15.0 | 314.0 | 35.0 | 5.0 | 168.0 | 3.19 | 1.71 | 8.08 | 16.99 | 0.85 | 0.93 |
| 24 | CAY | 116.0 | 31.0 | 0.0 | 47.0 | 1.0 | 1.0 | 1.0 | 77.0 | 25.0 | 12.0 | 273... | 6.03 | 5.55 | 10.59 | 69.17 | 2.88 | 3.0 |
| 25 | TUSCANY | 533.0 | 236.0 | 65.0 | 147.0 | 12.0 | 21.0 | 13.0 | 382.0 | 102.0 | 15.0 | 38.0 | 1.89 | 5.42 | 10.63 | 2.71 | 0.55 | 4.97 |
| 26 | TEIID | 467.0 | 182.0 | 0.0 | 0.0 | 36.0 | 12.0 | 17.0 | 338.0 | 81.0 | 6.0 | 264.0 | 3.47 | 4.78 | 11.51 | 24.76 | 1.27 | 3.9 |
| 27 | ORBIZ | 812.0 | 265.0 | 45.0 | 396.0 | 7.0 | 4.0 | 8.0 | 303.0 | 39.0 | 12.0 | 10.0 | 2.22 | 2.71 | 16.83 | 10.83 | 0.67 | 0.5 |
| 28 | SOLR | 534.0 | 168.0 | 95.0 | 193.0 | 22.0 | 6.0 | 7.0 | 262.0 | 209.0 | 50.0 | 215... | 3.06 | 5.34 | 11.18 | 14.04 | 1.92 | 3.78 |
| 29 | AMBAR | 827.0 | 479.0 | 12.0 | 84.0 | 129.0 | 6.0 | 21.0 | 771.0 | 22.0 | 7.0 | 52.0 | 1.88 | 1.13 | 2.42 | 5.77 | 0.54 | 0.6 |
| 30 | CACTUS | 221.0 | 58.0 | 59.0 | 44.0 | 12.0 | 5.0 | 10.0 | 166.0 | 35.0 | 5.0 | 274.0 | 5.22 | 5.31 | 14.98 | 50.3 | 1.56 | 3.83 |

- WMC: Weighted methods per class
- DIT: Depth of Inheritance Tree
- NOC: Number of Children
- CBO: Coupling between object classes
- RFC: Response for a Class
- LCOM: Lack of cohesion in methods

In addition it also calculates for each class

- Ca: Afferent couplings
- NPM: Number of public methods

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

| defect-reports.arff | | | | | | | |
|--------------------------|----------|---|----------|-------------|---------------------------|---|-------------|
| Relation: defect-reports | | | | | | | |
| No. | id | description | priority | project | project_name | title | type |
| | Numeric | String | Nominal | String | String | String | Nominal |
| 25917 | 283308.0 | A tab for the lmx console that grabs information fro... | Major | FELIX | Felix | A graphical tab to remotely get memory activity | New Feature |
| 25916 | 283307.0 | This MBean / Graphical couple is able to remotely in... | Major | FELIX | Felix | A graphical tab to remotely interact with obr | New Feature |
| 13068 | 135171.0 | We need a .gitignore file under nutch/ so git does no... | Trivial | NUTCH | Nutch | A .gitignore file for Nutch | Improvement |
| 4289 | 60889.0 | Should be work with JSP and Facelets | Major | | MyFaces Tobago | A Bean-Tag or CRUD-Tag to create dynamic pages with low effort | New Feature |
| 47466 | 501275.0 | try examination example with exam set 2: after initia... | Major | PLANNER | OptaPlanner | A BestSolutionChangedEvent should be fired when a StartingSolutionInit... | Bug |
| 28177 | 308725.0 | Several people have asked if ManifoldCF supports C... | Major | CONNECTO... | ManifoldCF | A CMS connector would be helpful | New Feature |
| 6851 | 85882.0 | This bug is a little symmetric of SMXCOMP-446 (a CXF... | Major | | ServiceMix Components | A CXF-BC provider used with WS-RM sends the CreateSequence request ... | Bug |
| 6721 | 84487.0 | Clob cannot be directly be consumed by Solr. So Jdb... | Minor | SOLR | Solr | A Clobtransformer to read strings from Clob | Improvement |
| 6353 | 80795.0 | This means you cant try and create the collection ag... | Major | SOLR | Solr | A Collection that is only partially created and then deleted will leave pre ... | Bug |
| 39189 | 416166.0 | There should be a standard converter for java.util.C... | Minor | XSTR | XStream | A currency converter | Improvement |
| 1246 | 32119.0 | A DIV tag that utilized Ajax to obtain its contents. S... | Major | | Struts 2 | A DIV tag that utilized Ajax to obtain its contents | New Feature |
| 19412 | 197278.0 | See the following comment for detailed description... | Major | | Hadoop HDFS | A Distributed and Cooperative NameNode Cluster for a Highly-Available ... | New Feature |
| 1820 | 38999.0 | A few of the projects were missing site.xml site desc... | Minor | WICKET | Wicket | A Few Wicket Projects are Missing site.xml and wicket-site-skin | Bug |
| 51153 | 556158.0 | I have attached a patch that provides a Gradle build... | Major | GROOVY | groovy | A Gradle build for groovy | New Feature |
| 52532 | 575089.0 | See JBSEAM-4276.Patch proposed in JBSEAM-4276 i... | Blocker | | JBoss Enterprise Appli... | A JBDS generated WAR project with reverse-engineered entities doesnt ... | Bug |
| 58047 | 645660.0 | A patch proposed in JBSEAM-4276 is not applied int... | Blocker | | Developer Studio OBo... | A JBDS generated WAR project with reverse-engineered entities doesnt ... | Bug |
| 38880 | 413151.0 | A jobExecution does not need a start time until it ac... | Minor | | Spring Batch | A JobExecution does not need a start time until it actually starts | Bug |
| 49068 | 523929.0 | Non-leaf nodes shouldnt have a layerInfo component... | Major | MAPFACES | MapFaces | A LayerInfo component is added even if the node is not a leaf | Bug |
| 7074 | 88685.0 | It would be useful if service-mix provided a store im... | Major | | ServiceMix | A MongoDB Store would be useful | New Feature |
| 6404 | 81524.0 | Id like to fix this for 4 - Its a simple fix. | Blocker | SOLR | Solr | A PeerSync attempt to its replicas by a candidate leader should not fail o... | Bug |
| 5323 | 72970.0 | We could do a reference implementation of the Load... | Major | STRATOS | Stratos | A Reference Load Balancer Extension API Implementation for HAProxy | Sub-task |
| 40133 | 425190.0 | A Registry of projects should be maintained. Curren... | Major | UDIG | uDig | A Registry of projects should be maintained. | Bug |
| 6730 | 84550.0 | This is same as SOLR-139. A new Issue is opened so... | Major | SOLR | Solr | A RequestProcessor to support updates | New Feature |
| 33550 | 376598.0 | We need to resolve this issue. Major case | Major | ABDERA | Abdera | A Runtime Exception Problem | Bug |
| 33218 | 359243.0 | A SOAP 1.2 Message with a SWARef attachment is d... | Major | AXIOM | Axiom | A SOAP 1.2 SWARef Message is denied | Bug |
| 42515 | 443376.0 | see attached screenshot. There should be a cache so... | Major | SONAR | SonarQube | A SQL Select Query is done on Rules table each time a new violation is s... | Improvement |
| 55096 | 608707.0 | The simple plugin tutorial has not been updated fro... | Minor | GEOS | GeoServer | A Simple Plugin tutorial is not available in the new docs for geoserver ve... | Improvement |
| 6501 | 82590.0 | This is starting to really bug me because tests almos... | Major | SOLR | Solr | A SolrIndexSearcher can be left open if the executor rejects a task. | Bug |
| 36588 | 380099.0 | It could be useful if a state can extend more than on... | Minor | | Spring Web Flow | A State should be able to extend more than one states | Improvement |
| 32198 | 347238.0 | The web application we are building in this tutorial ... | Trivial | BEEHIVE | Beehive | A Typo in tutorial_pageflow.html | Bug |
| 19000 | 195425.0 | A UDF that can export data to JDBC databases. | Minor | HIVE | Hive | A UDF that can export data to JDBC databases. | New Feature |
| 59731 | 668913.0 | Because of new class hierarchy and co-variant return... | Blocker | ISPN | Infinispan | A Weld upgrade is needed | |
| 4290 | 60890.0 | Should be work with JSP and Facelets. | Major | | MyFaces Tobago | A Wizard-Tag to create dynamic wizard pages with low effort | New Feature |
| 2059 | 41215.0 | It probably would make sense to have a Set of "Attri... | Minor | VYSER | VYSER | A XMLElement might have duplicate attributes which isnt allowed in XML | Bug |

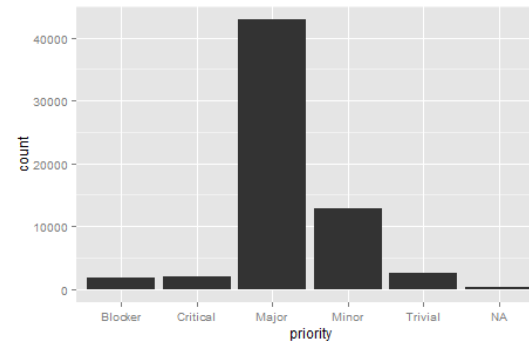
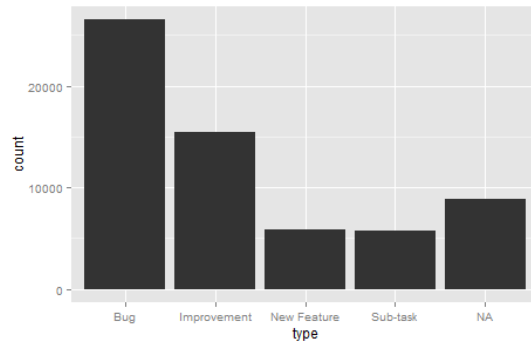
Component Prediction

More ▼

Both Alex and Steve emphasized that research on component prediction seems worthwhile from the industry viewpoint.

Predictor-input: report_description + report_title

Predictor-output: report_project-name



Subclass Discovery

More ▼

Predicting Bugs
- semi-supervised. use the given types to train the model.
then predict the missing labels [bug or new feature]

Predictor-input: report_description + report_title +
report_priority [not sure if this can also be added for input]

Predictor-output-1: report_type [bug or new feature]

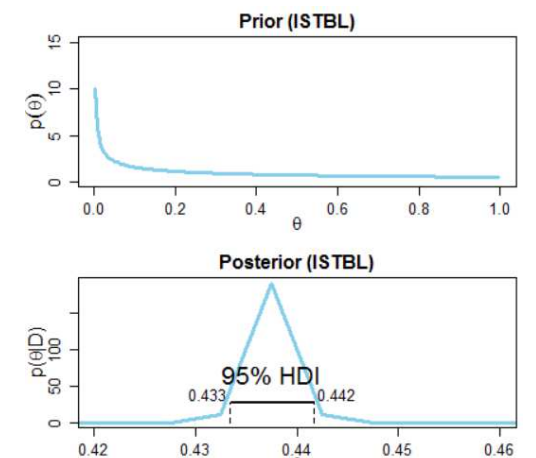
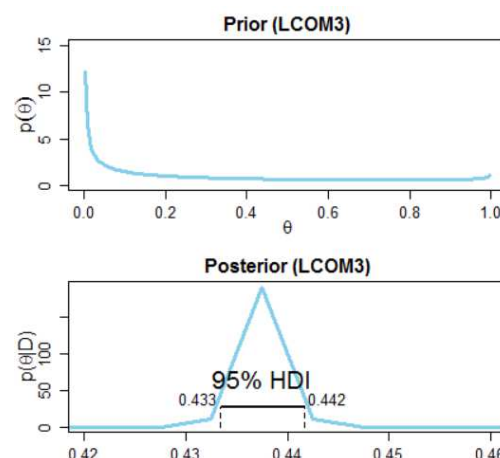
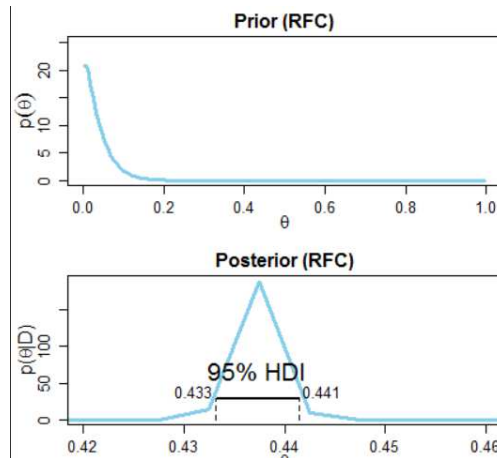
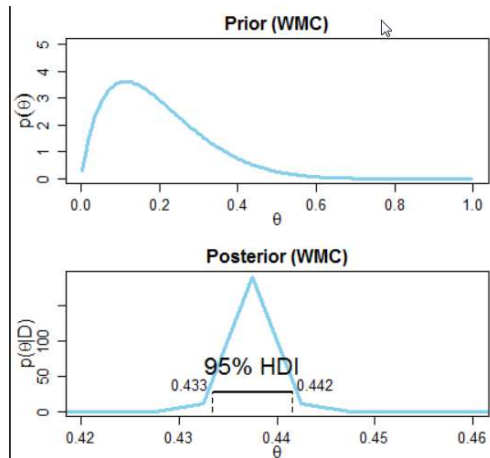
Predictor-output-2: report_priority [optional, if not added
for input and if time allows to predict as output]

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

```
# Total PROJECTS      55642
# Total BUG            24344
# Total NOT-BUG        31298
```

```
post = BernBeta( c(1.88,7.88), c(rep(1,24344),rep(0,31298)))
```

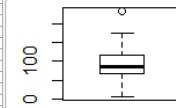
| Relation: defect-metrics | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|-------------|---------------|-----------|-------------------|-------------------|----------------|---------------|----------------|-------------|-------------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| No. | name | project_count | bug_count | new_feature_count | improvement_count | sub_task_count | blocker_count | critical_count | major_count | minor_count | trivial_count | NOC | WMC | CBO | RFC | LCOM | Ca | Ce | ISTBL | LCOM3 | LOC | Quality |
| | String | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Numeric | Normal |
| 1 | CXF | 389.0 | 167.0 | 26.0 | 116.0 | 20.0 | 0.0 | 4.0 | 312.0 | 65.0 | 8.0 | 173.0 | 3.93 | 3.45 | 10.6 | 24.04 | 1.69 | 1.93 | 0.53 | 0.51 | 75.81 | 1.720 |
| 2 | HBASE | 1126.0 | 471.0 | 47.0 | 289.0 | 132.0 | 50.0 | 66.0 | 699.0 | 217.0 | 94.0 | 402.0 | 3.95 | 5.13 | 12.22 | 37.91 | 2.58 | 2.82 | 0.52 | 0.49 | 105.48 | 52.1 |
| 3 | KARAF | 316.0 | 100.0 | 25.0 | 88.0 | 15.0 | 6.0 | 5.0 | 271.0 | 29.0 | 5.0 | 328.0 | 2.84 | 1.74 | 7.68 | 14.57 | 0.96 | 0.36 | 0.5 | 0.7 | 78.18 | 3.480 |
| 4 | SONAR | 577.0 | 124.0 | 69.0 | 304.0 | 22.0 | 1.0 | 17.0 | 417.0 | 126.0 | 16.0 | 194.0 | 4.27 | 2.01 | 10.3 | 94.42 | 1.08 | 1.08 | 0.5 | 0.5 | 84.06 | 3.870 |
| 5 | JBPM | 447.0 | 117.0 | 0.0 | 0.0 | 17.0 | 5.0 | 15.0 | 366.0 | 46.0 | 1.0 | 178.0 | 2.92 | 4.48 | 12.61 | 8.19 | 0.99 | 3.51 | 0.78 | 0.82 | 121.5 | 5.231 |
| 6 | FABRICTHREE | 209.0 | 70.0 | 87.0 | 47.0 | 1.0 | 7.0 | 11.0 | 160.0 | 29.0 | 2.0 | 544.0 | 2.47 | 4.48 | 9.25 | 5.57 | 0.82 | 3.75 | 0.82 | 0.51 | 61.59 | 6.031 |
| 7 | NUTCH | 250.0 | 67.0 | 30.0 | 96.0 | 35.0 | 1.0 | 9.0 | 128.0 | 87.0 | 29.0 | 534.0 | 3.17 | 5.42 | 13.41 | 7.63 | 1.48 | 4.06 | 0.73 | 0.48 | 103.1 | 1.610 |
| 8 | CMIS | 121.0 | 41.0 | 14.0 | 39.0 | 9.0 | 1.0 | 4.0 | 79.0 | 36.0 | 1.0 | 908.0 | 4.61 | 3.35 | 10.51 | 106.48 | 1.15 | 2.29 | 0.67 | 0.54 | 85.06 | 1.690 |
| 9 | PIG | 336.0 | 148.0 | 40.0 | 89.0 | 28.0 | 8.0 | 11.0 | 265.0 | 38.0 | 14.0 | 466.0 | 3.59 | 3.73 | 10.46 | 7.03 | 0.42 | 3.35 | 0.89 | 0.72 | 75.27 | 8.371 |
| 10 | OPENEJB | 991.0 | 73.0 | 29.0 | 43.0 | 93.0 | 2.0 | 1.0 | 298.0 | 28.0 | 2.0 | 166.0 | 3.34 | 3.78 | 11.33 | 18.68 | 1.65 | 2.24 | 0.58 | 0.6 | 92.42 | 0.750 |
| 11 | OPENNLP | 233.0 | 33.0 | 17.0 | 123.0 | 3.0 | 0.0 | 0.0 | 117.0 | 108.0 | 8.0 | 744.0 | 2.83 | 4.43 | 9.51 | 8.83 | 2.1 | 2.4 | 0.53 | 0.57 | 77.17 | 0.00 |
| 12 | JBRULES | 376.0 | 127.0 | 0.0 | 0.0 | 12.0 | 5.0 | 16.0 | 325.0 | 25.0 | 2.0 | 387.0 | 6.1 | 6.72 | 12.95 | 80.91 | 2.91 | 4.02 | 0.58 | 0.58 | 92.85 | 7.091 |
| 13 | ARO | 215.0 | 40.0 | 0.0 | 0.0 | 3.0 | 2.0 | 10.0 | 171.0 | 27.0 | 1.0 | 670.0 | 3.9 | 6.04 | 9.25 | 40.67 | 3.13 | 3.18 | 0.5 | 0.59 | 73.99 | 2.230 |
| 14 | MILYN | 127.0 | 30.0 | 35.0 | 27.0 | 10.0 | 3.0 | 2.0 | 106.0 | 15.0 | 1.0 | 154.0 | 3.16 | 4.34 | 9.41 | 13.5 | 2.07 | 2.37 | 0.53 | 0.59 | 65.12 | 1.180 |
| 15 | COCOON | 101.0 | 56.0 | 6.0 | 22.0 | 6.0 | 1.0 | 3.0 | 73.0 | 22.0 | 2.0 | 234.0 | 3.88 | 3.68 | 12.84 | 19.43 | 0.65 | 3.18 | 0.83 | 0.46 | 116.1 | 2.220 |
| 16 | AVRO | 206.0 | 65.0 | 45.0 | 77.0 | 5.0 | 7.0 | 2.0 | 158.0 | 34.0 | 5.0 | 558.0 | 3.61 | 3.34 | 9.39 | 16.23 | 1.74 | 1.86 | 0.52 | 0.59 | 76.92 | 2.840 |
| 17 | BOOKKEEPER | 209.0 | 82.0 | 14.0 | 57.0 | 45.0 | 11.0 | 3.0 | 153.0 | 36.0 | 6.0 | 272.0 | 4.78 | 4.51 | 9.95 | 59.14 | 2.38 | 2.63 | 0.53 | 0.48 | 67.93 | 5.491 |
| 18 | MAHOUT | 155.0 | 52.0 | 16.0 | 65.0 | 6.0 | 0.0 | 0.0 | 88.0 | 52.0 | 15.0 | 176.0 | 3.14 | 4.29 | 10.8 | 8.17 | 1.56 | 3.36 | 0.68 | 0.47 | 75.14 | 0.00 |
| 19 | SHINDIG | 214.0 | 88.0 | 25.0 | 79.0 | 6.0 | 3.0 | 2.0 | 146.0 | 54.0 | 9.0 | 448.0 | 2.73 | 2.77 | 8.07 | 8.81 | 1.04 | 1.89 | 0.65 | 0.6 | 49.68 | 2.060 |
| 20 | SOOCP | 238.0 | 66.0 | 30.0 | 53.0 | 45.0 | 11.0 | 3.0 | 171.0 | 26.0 | 17.0 | 950.0 | 2.29 | 3.7 | 9.95 | 36.08 | 1.27 | 2.49 | 0.66 | 0.68 | 75.5 | 4.050 |
| 21 | ISPN | 414.0 | 126.0 | 0.0 | 0.0 | 10.0 | 21.0 | 23.0 | 307.0 | 54.0 | 6.0 | 238.0 | 4.72 | 6.01 | 11.42 | 73.24 | 3.0 | 3.4 | 0.53 | 0.55 | 72.94 | 13.391 |
| 22 | OPID | 734.0 | 326.0 | 65.0 | 242.0 | 31.0 | 16.0 | 9.0 | 530.0 | 159.0 | 20.0 | 544.0 | 3.05 | 4.69 | 13.35 | 77.9 | 1.68 | 3.33 | 0.66 | 0.57 | 96.75 | 11.11 |
| 23 | SWITCHYARD | 390.0 | 104.0 | 0.0 | 0.0 | 17.0 | 18.0 | 15.0 | 314.0 | 35.0 | 5.0 | 168.0 | 3.19 | 1.71 | 8.08 | 10.99 | 0.85 | 0.93 | 0.52 | 0.58 | 54.17 | 8.81 |
| 24 | CAY | 116.0 | 31.0 | 0.0 | 47.0 | 1.0 | 1.0 | 1.0 | 77.0 | 25.0 | 12.0 | 273.0 | 6.03 | 5.55 | 10.59 | 69.17 | 2.88 | 3.0 | 0.51 | 0.56 | 122.1 | 0.530 |
| 25 | TUSCANY | 533.0 | 236.0 | 65.0 | 147.0 | 12.0 | 21.0 | 13.0 | 382.0 | 102.0 | 15.0 | 38.0 | 1.89 | 5.42 | 10.63 | 2.71 | 0.55 | 4.97 | 0.9 | 0.59 | 53.37 | 15.051 |
| 26 | TEIID | 467.0 | 182.0 | 0.0 | 0.0 | 36.0 | 12.0 | 17.0 | 338.0 | 81.0 | 6.0 | 264.0 | 3.47 | 4.78 | 11.51 | 24.76 | 1.27 | 3.9 | 0.75 | 0.42 | 86.65 | 11.31 |
| 27 | OFBIZ | 832.0 | 265.0 | 46.0 | 396.0 | 77.0 | 4.0 | 8.0 | 303.0 | 396.0 | 121.0 | 18.0 | 3.67 | 1.11 | 16.83 | 10.83 | 0.67 | 0.67 | 0.5 | 0.44 | 141.1 | 3.820 |
| 28 | SOLR | 534.0 | 168.0 | 95.0 | 193.0 | 22.0 | 6.0 | 7.0 | 262.0 | 209.0 | 50.0 | 215.0 | 3.06 | 5.34 | 11.18 | 14.04 | 1.92 | 3.78 | 0.66 | 0.54 | 92.67 | 4.090 |
| 29 | AMBAR | 827.0 | 479.0 | 12.0 | 84.0 | 129.0 | 6.0 | 21.0 | 771.0 | 22.0 | 7.0 | 52.0 | 1.88 | 1.13 | 2.42 | 5.77 | 0.54 | 0.6 | 0.53 | 0.81 | 7.23 | 15.641 |
| 30 | CACTUS | 221.0 | 58.0 | 59.0 | 44.0 | 12.0 | 5.0 | 10.0 | 166.0 | 35.0 | 5.0 | 274.0 | 5.22 | 5.31 | 14.98 | 50.3 | 1.56 | 3.83 | 0.71 | 0.6 | 138.1 | 3.940 |



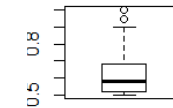
PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

Relation: defect-metrics

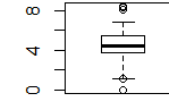
| No. | name | project_count | bug_count | new_feature_count | improvement_count | sub_task_count | blocker_count | critical_count | major_count | minor_count | trivial_count | NOC | WMC | CBO | RFC | LCOM | Ca | Ce | ISTBL | LCOM3 | LOC | QT | Quality |
|-----|-------------|---------------|-----------|-------------------|-------------------|----------------|---------------|----------------|-------------|-------------|---------------|--------|------|------|-------|--------|------|------|-------|-------|--------|--------|---------|
| 1 | OXF | 389.0 | 167.0 | 26.0 | 116.0 | 20.0 | 0.0 | 4.0 | 312.0 | 65.0 | 8.0 | 173... | 3.93 | 3.45 | 10.6 | 24.04 | 1.69 | 1.93 | 0.53 | 0.51 | 75.81 | 1.720 | |
| 2 | HBASE | 1126.0 | 471.0 | 47.0 | 289.0 | 132.0 | 50.0 | 66.0 | 699.0 | 217.0 | 94.0 | 402... | 3.95 | 5.13 | 12.22 | 37.91 | 2.58 | 2.82 | 0.52 | 0.49 | 105... | 48.521 | |
| 3 | KARAF | 316.0 | 100.0 | 25.0 | 88.0 | 15.0 | 6.0 | 5.0 | 271.0 | 29.0 | 5.0 | 328.0 | 2.84 | 1.74 | 7.68 | 14.57 | 0.96 | 0.96 | 0.5 | 0.7 | 78.18 | 3.480 | |
| 4 | SONAR | 577.0 | 124.0 | 69.0 | 304.0 | 22.0 | 1.0 | 17.0 | 417.0 | 126.0 | 16.0 | 194.0 | 4.27 | 2.01 | 10.3 | 94.42 | 1.08 | 1.08 | 0.5 | 0.47 | 84.06 | 3.870 | |
| 5 | JBPM | 447.0 | 117.0 | 0.0 | 0.0 | 17.0 | 5.0 | 15.0 | 366.0 | 46.0 | 1.0 | 178.0 | 2.92 | 4.48 | 12.61 | 8.19 | 0.99 | 3.51 | 0.78 | 0.82 | 121... | 5.231 | |
| 6 | FABRICTHREE | 209.0 | 70.0 | 87.0 | 47.0 | 1.0 | 7.0 | 11.0 | 160.0 | 29.0 | 2.0 | 544.0 | 2.47 | 4.48 | 9.25 | 5.57 | 0.82 | 3.75 | 0.82 | 0.51 | 61.59 | 6.031 | |
| 7 | NUTCH | 250.0 | 67.0 | 30.0 | 96.0 | 35.0 | 1.0 | 5.0 | 128.0 | 87.0 | 29.0 | 534.0 | 3.17 | 5.42 | 13.41 | 7.63 | 1.48 | 4.06 | 0.73 | 0.48 | 103... | 1.610 | |
| 8 | CMIS | 121.0 | 41.0 | 14.0 | 39.0 | 9.0 | 1.0 | 4.0 | 79.0 | 36.0 | 1.0 | 908.0 | 4.61 | 3.35 | 10.51 | 106.48 | 1.15 | 2.29 | 0.67 | 0.54 | 85.06 | 1.690 | |
| 9 | PIG | 336.0 | 148.0 | 40.0 | 89.0 | 28.0 | 8.0 | 11.0 | 265.0 | 38.0 | 14.0 | 466.0 | 2.59 | 3.73 | 10.46 | 7.03 | 0.42 | 3.35 | 0.89 | 0.72 | 75.27 | 8.371 | |
| 10 | OPENEJB | 291.0 | 73.0 | 29.0 | 43.0 | 93.0 | 2.0 | 1.0 | 298.0 | 28.0 | 2.0 | 166... | 3.34 | 3.78 | 11.33 | 18.68 | 1.63 | 2.24 | 0.58 | 0.6 | 92.42 | 0.750 | |
| 11 | OPENNLP | 233.0 | 33.0 | 17.0 | 123.0 | 3.0 | 0.0 | 0.0 | 117.0 | 108.0 | 8.0 | 744.0 | 2.83 | 4.43 | 9.51 | 8.83 | 2.1 | 2.4 | 0.53 | 0.57 | 77.17 | 0.00 | |
| 12 | JBRULES | 376.0 | 127.0 | 0.0 | 0.0 | 12.0 | 5.0 | 16.0 | 325.0 | 25.0 | 2.0 | 387... | 6.1 | 6.72 | 12.95 | 80.91 | 2.91 | 4.02 | 0.58 | 0.58 | 92.85 | 7.091 | |
| 13 | ARO | 215.0 | 40.0 | 0.0 | 0.0 | 3.0 | 2.0 | 10.0 | 171.0 | 27.0 | 1.0 | 670... | 3.9 | 6.04 | 9.25 | 40.67 | 3.13 | 3.18 | 0.5 | 0.59 | 73.99 | 2.230 | |
| 14 | MILYN | 127.0 | 30.0 | 35.0 | 27.0 | 10.0 | 3.0 | 2.0 | 106.0 | 15.0 | 1.0 | 154... | 3.16 | 4.34 | 9.41 | 13.5 | 2.07 | 2.37 | 0.53 | 0.59 | 65.12 | 1.180 | |
| 15 | COCOON | 101.0 | 56.0 | 6.0 | 22.0 | 6.0 | 1.0 | 3.0 | 73.0 | 22.0 | 2.0 | 234.0 | 3.88 | 3.68 | 12.84 | 19.43 | 0.65 | 3.18 | 0.83 | 0.46 | 116... | 2.220 | |
| 16 | AVRO | 206.0 | 65.0 | 45.0 | 77.0 | 5.0 | 7.0 | 2.0 | 158.0 | 34.0 | 5.0 | 358.0 | 3.61 | 3.34 | 9.39 | 16.23 | 1.74 | 1.86 | 0.52 | 0.59 | 76.92 | 2.840 | |
| 17 | BOOKKEEPER | 209.0 | 82.0 | 14.0 | 57.0 | 45.0 | 11.0 | 3.0 | 153.0 | 36.0 | 6.0 | 272... | 4.78 | 4.51 | 9.95 | 59.14 | 2.38 | 2.63 | 0.53 | 0.48 | 67.93 | 5.491 | |
| 18 | MAHOUT | 155.0 | 52.0 | 16.0 | 65.0 | 6.0 | 0.0 | 0.0 | 88.0 | 52.0 | 15.0 | 176... | 3.14 | 4.79 | 10.8 | 8.17 | 1.56 | 3.36 | 0.68 | 0.47 | 75.14 | 0.00 | |
| 19 | SHINDIG | 214.0 | 88.0 | 25.0 | 79.0 | 6.0 | 3.0 | 2.0 | 146.0 | 54.0 | 9.0 | 448.0 | 2.73 | 2.77 | 8.07 | 8.81 | 1.04 | 1.89 | 0.65 | 0.6 | 49.68 | 2.060 | |
| 20 | SOOOP | 228.0 | 66.0 | 53.0 | 45.0 | 11.0 | 3.0 | 3.0 | 171.0 | 26.0 | 17.0 | 950.0 | 2.79 | 3.7 | 9.95 | 36.08 | 1.27 | 2.49 | 0.66 | 0.68 | 75.5 | 4.050 | |
| 21 | TSN | 414.0 | 126.0 | 0.0 | 0.0 | 10.0 | 21.0 | 23.0 | 307.0 | 54.0 | 6.0 | 238... | 4.72 | 6.01 | 11.42 | 72.24 | 3.0 | 3.4 | 0.53 | 0.55 | 72.94 | 13.391 | |
| 22 | OPID | 734.0 | 326.0 | 65.0 | 242.0 | 31.0 | 16.0 | 9.0 | 530.0 | 159.0 | 20.0 | 544.0 | 5.05 | 4.69 | 13.35 | 77.9 | 1.68 | 3.33 | 0.66 | 0.57 | 96.75 | 11.11 | |
| 23 | SWITCHYARD | 390.0 | 104.0 | 0.0 | 0.0 | 17.0 | 18.0 | 15.0 | 314.0 | 35.0 | 5.0 | 168.0 | 3.19 | 1.71 | 8.08 | 16.99 | 0.85 | 0.93 | 0.52 | 0.58 | 54.17 | 8.8 | |
| 24 | CAY | 116.0 | 31.0 | 30.0 | 47.0 | 1.0 | 1.0 | 1.0 | 77.0 | 25.0 | 12.0 | 273... | 6.03 | 5.55 | 10.59 | 69.17 | 2.88 | 3.0 | 0.51 | 0.36 | 122... | 0.530 | |
| 25 | TUSCANY | 533.0 | 236.0 | 65.0 | 147.0 | 12.0 | 21.0 | 13.0 | 382.0 | 102.0 | 15.0 | 38.0 | 1.89 | 2.42 | 10.63 | 27.1 | 0.53 | 4.97 | 0.9 | 0.59 | 53.37 | 15.051 | |
| 26 | TEIID | 467.0 | 182.0 | 0.0 | 0.0 | 36.0 | 12.0 | 17.0 | 338.0 | 81.0 | 6.0 | 264.0 | 3.47 | 4.78 | 11.51 | 24.76 | 1.27 | 3.9 | 0.75 | 0.42 | 86.65 | 11.31 | |
| 27 | OBZL | 832.0 | 265.0 | 46.0 | 396.0 | 77.0 | 4.0 | 8.0 | 303.0 | 396.0 | 121.0 | 18.0 | 3.67 | 1.11 | 16.83 | 10.83 | 0.67 | 0.67 | 0.5 | 0.44 | 141... | 3.820 | |
| 28 | SOLR | 534.0 | 168.0 | 95.0 | 193.0 | 22.0 | 6.0 | 7.0 | 262.0 | 209.0 | 30.0 | 215... | 3.06 | 5.34 | 11.18 | 14.04 | 1.92 | 3.78 | 0.66 | 0.54 | 93.67 | 4.090 | |
| 29 | AMBAR | 827.0 | 479.0 | 12.0 | 84.0 | 129.0 | 6.0 | 21.0 | 771.0 | 22.0 | 7.0 | 52.0 | 1.88 | 1.13 | 2.42 | 5.77 | 0.54 | 0.6 | 0.53 | 0.81 | 7.23 | 15.641 | |
| 30 | CACTUS | 221.0 | 58.0 | 59.0 | 44.0 | 12.0 | 5.0 | 10.0 | 166.0 | 35.0 | 5.0 | 274.0 | 5.22 | 5.31 | 14.98 | 50.3 | 1.56 | 3.83 | 0.71 | 0.6 | 138... | 3.940 | |



LOC



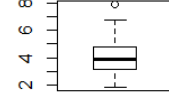
ISTBL



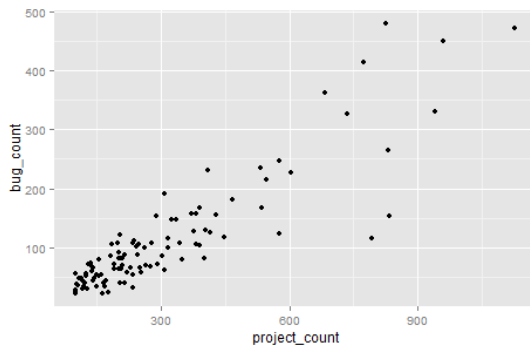
CBO



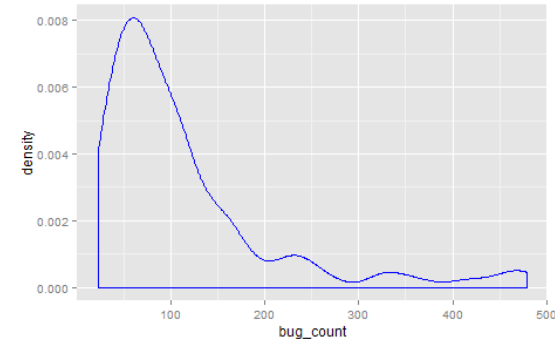
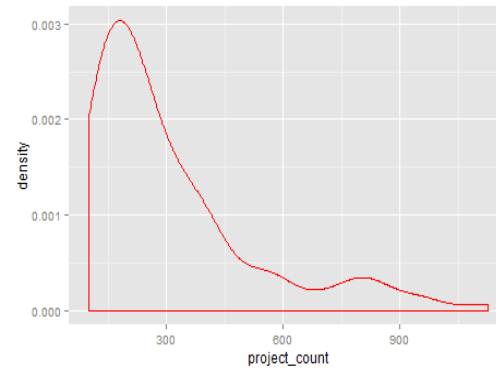
WMC



WMC



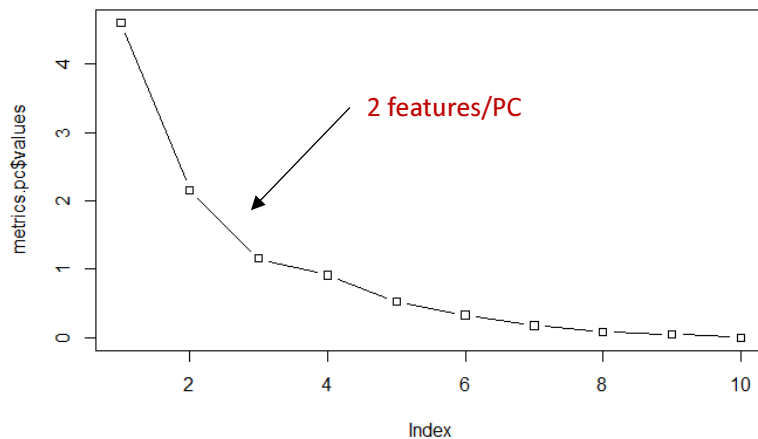
No of bugs increases with project size



Both pdfs are skewed to the right. Average issues reported per project are on a range of 150-250.

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

Scree plot of software metrics principal components



```
> metrics.cor
```

| | NOC | WMC | CBO | RFC | LCOM | Ca | Ce | ISTBL | LCOM3 | LOC |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| NOC | 1.00 | 0.35 | 0.49 | 0.10 | 0.49 | 0.68 | 0.20 | -0.36 | -0.17 | 0.18 |
| WMC | 0.35 | 1.00 | 0.48 | 0.65 | 0.77 | 0.46 | 0.32 | -0.11 | -0.21 | 0.64 |
| CBO | 0.49 | 0.48 | 1.00 | 0.64 | 0.39 | 0.68 | 0.87 | 0.00 | -0.37 | 0.57 |
| RFC | 0.10 | 0.65 | 0.64 | 1.00 | 0.38 | 0.24 | 0.69 | 0.17 | -0.35 | 0.90 |
| LCOM | 0.49 | 0.77 | 0.39 | 0.38 | 1.00 | 0.53 | 0.16 | -0.25 | -0.11 | 0.46 |
| Ca | 0.68 | 0.46 | 0.68 | 0.24 | 0.53 | 1.00 | 0.23 | -0.65 | -0.35 | 0.31 |
| Ce | 0.20 | 0.32 | 0.87 | 0.69 | 0.16 | 0.23 | 1.00 | 0.42 | -0.29 | 0.55 |
| ISTBL | -0.36 | -0.11 | 0.00 | 0.17 | -0.25 | -0.65 | 0.42 | 1.00 | 0.17 | 0.01 |
| LCOM3 | -0.17 | -0.21 | -0.37 | -0.35 | -0.11 | -0.35 | -0.29 | 0.17 | 1.00 | -0.28 |
| LOC | 0.18 | 0.64 | 0.57 | 0.90 | 0.46 | 0.31 | 0.55 | 0.01 | -0.28 | 1.00 |

```
> metrics.pc <- principal(metrics, nfactors=2, rotate="varimax")
```

Principal Components Analysis

Call: principal(r = metrics, nfactors = 2, rotate = "varimax")

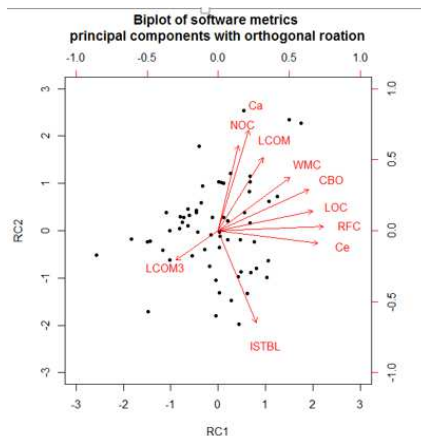
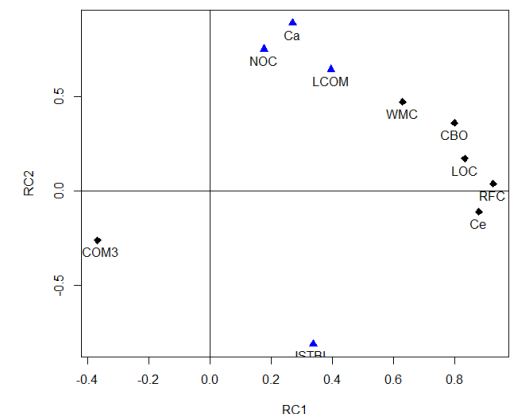
Standardized loadings (pattern matrix) based upon correlation matrix

| | RC1 | RC2 | h2 | u2 |
|-----|------|-------|------|------|
| RFC | 0.93 | 0.04 | 0.86 | 0.14 |
| Ce | 0.88 | -0.11 | 0.79 | 0.21 |
| LOC | 0.83 | 0.17 | 0.72 | 0.28 |
| CBO | 0.80 | 0.36 | 0.77 | 0.23 |
| WMC | 0.63 | 0.47 | 0.62 | 0.38 |

| | RC1 | RC2 | h2 | u2 |
|-------|-------|-------|------|------|
| LCOM | 0.40 | 0.64 | 0.57 | 0.43 |
| LCOM3 | -0.37 | -0.26 | 0.20 | 0.80 |
| ISTBL | 0.34 | -0.81 | 0.77 | 0.23 |
| Ca | 0.27 | 0.89 | 0.86 | 0.14 |
| NOC | 0.18 | 0.75 | 0.59 | 0.41 |

| | RC1 | RC2 |
|----------------|------|------|
| SS loadings | 3.88 | 2.88 |
| Proportion Var | 0.39 | 0.29 |

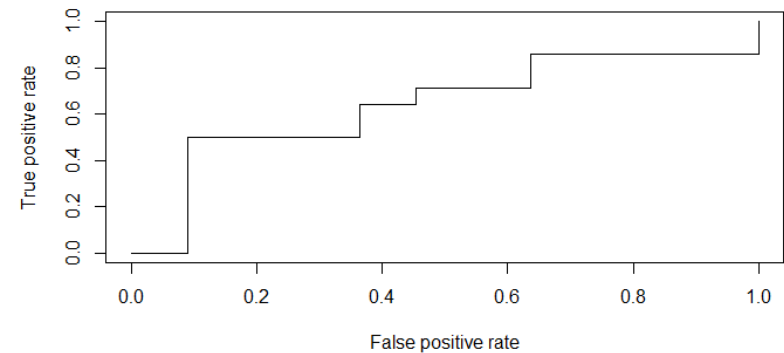
Factor plot for software metrics principle components



PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

Relation: defect-metrics

| No. | name | project_count | bug_count | new_feature_count | improvement_count | sub_task_count | blocker_count | critical_count | major_count | minor_count | trivial_count | NOC | WMC | CBO | RFC | LCOM | Ca | Ce | ISTBL | LCOM3 | LOC | QT | Quality |
|-----|-------------|---------------|-----------|-------------------|-------------------|----------------|---------------|----------------|-------------|-------------|---------------|--------|------|------|-------|--------|------|------|-------|-------|--------|--------|---------|
| 1 | CXF | 389.0 | 167.0 | 26.0 | 116.0 | 20.0 | 0.0 | 4.0 | 312.0 | 65.0 | 8.0 | 173... | 3.93 | 3.45 | 10.6 | 24.04 | 1.69 | 1.93 | 0.53 | 0.51 | 75.81 | 1.720 | |
| 2 | HBASE | 1126.0 | 471.0 | 47.0 | 289.0 | 132.0 | 50.0 | 66.0 | 699.0 | 217.0 | 94.0 | 402... | 3.95 | 5.13 | 12.22 | 37.91 | 2.58 | 2.82 | 0.52 | 0.49 | 105... | 48.521 | |
| 3 | KARAF | 316.0 | 100.0 | 25.0 | 88.0 | 15.0 | 6.0 | 5.0 | 271.0 | 29.0 | 5.0 | 328.0 | 2.84 | 1.74 | 7.68 | 14.57 | 0.96 | 0.96 | 0.5 | 0.7 | 78.18 | 3.480 | |
| 4 | SONAR | 577.0 | 124.0 | 69.0 | 304.0 | 22.0 | 1.0 | 17.0 | 417.0 | 126.0 | 16.0 | 194.0 | 4.27 | 2.01 | 10.3 | 94.42 | 1.08 | 1.08 | 0.5 | 0.47 | 84.06 | 3.870 | |
| 5 | JBPM | 447.0 | 117.0 | 0.0 | 0.0 | 17.0 | 5.0 | 15.0 | 366.0 | 46.0 | 1.0 | 178.0 | 2.92 | 4.48 | 12.61 | 8.19 | 0.99 | 3.51 | 0.78 | 0.82 | 121... | 5.231 | |
| 6 | FABRICTHREE | 209.0 | 70.0 | 87.0 | 47.0 | 1.0 | 7.0 | 11.0 | 160.0 | 29.0 | 2.0 | 544.0 | 2.47 | 4.48 | 9.25 | 5.57 | 0.82 | 3.75 | 0.82 | 0.51 | 61.59 | 6.031 | |
| 7 | WUTCH | 250.0 | 67.0 | 30.0 | 96.0 | 35.0 | 1.0 | 5.0 | 128.0 | 87.0 | 29.0 | 534.0 | 3.17 | 5.42 | 13.41 | 7.63 | 1.48 | 4.06 | 0.73 | 0.48 | 103... | 1.610 | |
| 8 | CMIS | 121.0 | 41.0 | 14.0 | 39.0 | 9.0 | 1.0 | 4.0 | 79.0 | 36.0 | 1.0 | 908.0 | 4.61 | 3.35 | 10.51 | 106.48 | 1.15 | 2.29 | 0.67 | 0.54 | 85.06 | 1.690 | |
| 9 | PIG | 336.0 | 148.0 | 40.0 | 89.0 | 28.0 | 8.0 | 11.0 | 265.0 | 38.0 | 14.0 | 466.0 | 2.59 | 3.73 | 10.46 | 7.03 | 0.42 | 3.35 | 0.89 | 0.72 | 75.27 | 8.371 | |
| 10 | OPENEJB | 291.0 | 73.0 | 29.0 | 43.0 | 93.0 | 2.0 | 1.0 | 258.0 | 28.0 | 2.0 | 166... | 3.34 | 3.78 | 11.33 | 18.68 | 1.65 | 2.24 | 0.58 | 0.6 | 92.42 | 0.750 | |
| 11 | OPENNLP | 233.0 | 33.0 | 17.0 | 123.0 | 3.0 | 0.0 | 0.0 | 117.0 | 108.0 | 8.0 | 744.0 | 2.83 | 4.43 | 9.51 | 8.83 | 2.1 | 2.4 | 0.53 | 0.57 | 72.17 | 0.00 | |
| 12 | JBRULES | 376.0 | 127.0 | 0.0 | 0.0 | 12.0 | 5.0 | 16.0 | 325.0 | 25.0 | 2.0 | 387... | 6.1 | 6.72 | 12.95 | 80.91 | 2.91 | 4.02 | 0.58 | 0.58 | 92.85 | 7.091 | |
| 13 | ARO | 215.0 | 40.0 | 0.0 | 0.0 | 3.0 | 2.0 | 10.0 | 171.0 | 27.0 | 1.0 | 670... | 3.9 | 6.04 | 9.25 | 40.67 | 3.13 | 3.18 | 0.5 | 0.59 | 73.99 | 2.230 | |
| 14 | MILYN | 127.0 | 30.0 | 35.0 | 27.0 | 10.0 | 3.0 | 2.0 | 106.0 | 15.0 | 1.0 | 154... | 3.16 | 4.34 | 9.41 | 13.5 | 2.07 | 2.37 | 0.53 | 0.59 | 65.12 | 1.180 | |
| 15 | COCOON | 101.0 | 56.0 | 6.0 | 22.0 | 6.0 | 1.0 | 3.0 | 73.0 | 22.0 | 2.0 | 234.0 | 3.88 | 3.68 | 12.84 | 19.43 | 0.65 | 3.18 | 0.83 | 0.46 | 116... | 2.220 | |
| 16 | AVRO | 206.0 | 65.0 | 45.0 | 77.0 | 5.0 | 7.0 | 2.0 | 158.0 | 34.0 | 5.0 | 358.0 | 3.61 | 3.34 | 9.39 | 16.23 | 1.74 | 1.86 | 0.52 | 0.59 | 76.92 | 2.840 | |
| 17 | BOOKKEEPER | 209.0 | 82.0 | 14.0 | 57.0 | 11.0 | 3.0 | 15.0 | 36.0 | 36.0 | 6.0 | 272... | 4.78 | 4.51 | 9.55 | 59.14 | 2.38 | 2.63 | 0.53 | 0.48 | 67.93 | 5.491 | |
| 18 | MAHOUT | 155.0 | 52.0 | 16.0 | 65.0 | 0.0 | 0.0 | 0.0 | 88.0 | 52.0 | 13.0 | 176... | 3.14 | 4.79 | 10.8 | 8.17 | 1.56 | 3.36 | 0.68 | 0.47 | 75.14 | 0.00 | |
| 19 | SHINDIG | 214.0 | 88.0 | 25.0 | 79.0 | 6.0 | 3.0 | 2.0 | 146.0 | 54.0 | 9.0 | 448.0 | 2.73 | 2.77 | 8.07 | 8.81 | 1.04 | 1.89 | 0.65 | 0.6 | 49.68 | 2.060 | |
| 20 | SOOOP | 228.0 | 66.0 | 30.0 | 53.0 | 45.0 | 11.0 | 3.0 | 171.0 | 26.0 | 17.0 | 950.0 | 2.79 | 3.7 | 9.95 | 36.08 | 1.27 | 2.49 | 0.66 | 0.68 | 75.5 | 4.050 | |
| 21 | TSN | 414.0 | 126.0 | 0.0 | 0.0 | 10.0 | 21.0 | 23.0 | 307.0 | 54.0 | 6.0 | 238... | 4.72 | 6.01 | 11.42 | 72.24 | 3.0 | 3.4 | 0.53 | 0.55 | 72.94 | 13.91 | |
| 22 | OPID | 734.0 | 326.0 | 65.0 | 242.0 | 31.0 | 16.0 | 9.0 | 530.0 | 159.0 | 20.0 | 544.0 | 5.05 | 4.69 | 13.35 | 77.9 | 1.68 | 3.33 | 0.66 | 0.57 | 96.75 | 11.11 | |
| 23 | SWITCHYARD | 390.0 | 104.0 | 0.0 | 0.0 | 17.0 | 18.0 | 15.0 | 314.0 | 35.0 | 5.0 | 168.0 | 3.19 | 1.71 | 8.08 | 16.99 | 0.85 | 0.93 | 0.52 | 0.58 | 54.17 | 8.8 | |
| 24 | CAY | 116.0 | 31.0 | 30.0 | 47.0 | 1.0 | 1.0 | 1.0 | 71.0 | 25.0 | 12.0 | 273... | 6.03 | 5.55 | 10.59 | 69.17 | 2.88 | 3.0 | 0.51 | 0.56 | 122... | 0.530 | |
| 25 | TUSCANY | 533.0 | 236.0 | 65.0 | 147.0 | 12.0 | 21.0 | 13.0 | 382.0 | 102.0 | 15.0 | 38.0 | 1.89 | 2.42 | 10.63 | 27.1 | 0.53 | 4.97 | 0.9 | 0.59 | 53.37 | 15.051 | |
| 26 | TEIID | 467.0 | 182.0 | 0.0 | 0.0 | 36.0 | 12.0 | 17.0 | 338.0 | 81.0 | 6.0 | 264.0 | 3.47 | 4.78 | 11.51 | 24.76 | 1.27 | 3.9 | 0.75 | 0.42 | 86.65 | 11.31 | |
| 27 | ORBIT | 832.0 | 265.0 | 46.0 | 396.0 | 77.0 | 4.0 | 8.0 | 303.0 | 396.0 | 121.0 | 18.0 | 3.67 | 1.11 | 16.83 | 10.83 | 0.67 | 0.67 | 0.5 | 0.44 | 141... | 3.820 | |
| 28 | SOLR | 534.0 | 168.0 | 95.0 | 193.0 | 22.0 | 6.0 | 7.0 | 282.0 | 209.0 | 30.0 | 215... | 3.06 | 5.34 | 11.18 | 14.04 | 1.92 | 3.78 | 0.66 | 0.54 | 93.67 | 4.090 | |
| 29 | AMBAR | 827.0 | 479.0 | 12.0 | 84.0 | 129.0 | 6.0 | 21.0 | 771.0 | 22.0 | 7.0 | 52.0 | 1.88 | 1.13 | 2.42 | 5.77 | 0.54 | 0.6 | 0.53 | 0.81 | 7.23 | 15.641 | |
| 30 | CACTUS | 221.0 | 58.0 | 59.0 | 44.0 | 12.0 | 5.0 | 10.0 | 166.0 | 35.0 | 5.0 | 274.0 | 5.22 | 5.31 | 14.98 | 50.3 | 1.56 | 3.83 | 0.71 | 0.6 | 138... | 3.940 | |



```
> model <- glm(fmla, data=train, family=binomial(link="logit"))
```

```
> smp_size <- floor(0.60 * nrow(metrics))
```

```
> cm <- table(truth=test$Quality, prediction=test$pred>0.1)
```

```
> print(cm)
      prediction
truth FALSE TRUE
0         1    10
1         0    14
```

Zero type 2 error

Conclusion: metrics regression performance is 70% correct. with zero false negative or type 2 error at regression threshold 0.1.

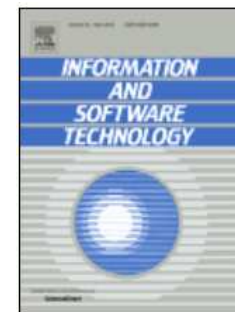
PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

Continue data minning and model comparison with

- DT, Näive Bayes, SVM (?), ensamble techniques

Summarize the findings and publish literature survey

- Collect publication requirements
- Preliminary selected IST for publication target



Information and Software Technology

Supports [Open Access](#) | [About this Journal](#) | [Sample Issue](#)

Formerly known as [Data Processing](#);

 [Get new article feed](#)

 [Get new \[Open Access\]\(#\) article feed](#)

 [Subscribe to new article alerts](#)

 [Add to Favorites](#)

Copyright © 2015 Elsevier B.V. All rights reserved

PhD plan -> Research Progress -> Next Step -> **Project timetable** -> Admin matters -> Next meeting

- Project roadmap revisited

[illegible]

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

- Project plan submitted
- Following Supervisor Meeting Reminder received from

From: admin-postmaster@brunel.ac.uk
Sent: 15 March 2015 01:16:25 (UTC+02:00) Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius
To: Mohammad Sharif Hanif
Subject: Supervisor Meeting Reminder

Dear Mohammad Sharif Hanif,

This email is a reminder that your supervisor meeting on 12/Mar/2015 is now overdue. You should upload your meeting documentation via eVision to ensure that your supervisor can review it.

PLEASE DO NOT REPLY TO THIS EMAIL AS THIS IS AN UNMONITORED ACCOUNT.

| My Supervisor Meetings 2014/5 | | |
|-------------------------------|-----------------------|------------------------------|
| Meeting Number | Expected Meeting Date | Meeting Status |
| 1 | 12/Mar/2015 | Supervisor Sign-Off Required |

PhD plan -> Research Progress -> Next Step -> Project timetable -> Admin matters -> Next meeting

- In 2-3 weeks

Result Expected:

- Predictive performance model comparison
- First publication of lit-survey requirements collection started