MobileMedia-SPL Data Set

Feature Model Evolution

The feature model evolution is described in the following publication:

E. Figueiredo, N. Cacho, C. Sant'Anna, M. Monteiro, U. Kulesza, A. Garcia, S. Soares, F. Ferrari, S. Khan, F.C. Filho, and F. Dantas. 2008. Evolving Software Product Lines with Aspects: An Empirical Study on Design Stability. In *International Conference on Software Engineering (ICSE)*. ACM, pages 261–270.

Revision	Changes	# Features	# Products
0	/	/	/
1	Core features added (including Root feature)	1	1
2	Mandatory Label added, optional Sort added as children of Root	3	2
3	Optional Favourite added as child of Root	4	4
4	Optional Copy added as child of Root	5	8
5	Optional SMS added as child of Root	6	12 (see comments on last page)

Implementation Evolution

Rev.	Description	Change Type	Changes	Changed Files	Comment	Expression
1	MobilePhoto core and exception handling included	Inclusion of non-functional concern	25 (24) changed files with 2,178 additions and 0 deletions.	[...]	24 files added (exclusion of features.txt)	Core
2	New feature added to count the number of times a photo has been viewed and sorting photos by highest viewing frequency. New feature added to edit the photo's label	Inclusion of mandatory Label feature and optional Sort feature	12 (11) changed files with 395 additions and 89 deletions.	src/lancs/mobilemedia/core/ui/MainUIMidlet.java	Format change	/
				src/lancs/mobilemedia/core/ui/controller/BaseController.java	One method signature changed (showImageList()), one method added to core (updateImage()); Two methods added to feature Sort (exchange(), bubbleSort())	Core, Sort
				src/lancs/mobilemedia/core/ui/controller/PhotoController.java	One method of core features added	Core
				src/lancs/mobilemedia/core/ui/datamodel/AlbumData.java	Method signature changed, three methods added	Core
				src/lancs/mobilemedia/core/ui/datamodel/ImageAccessor.java	Method signature changed	Core
				src/lancs/mobilemedia/core/ui/datamodel/ImageData.java	One new field of core added, one new field of sorting feature added, three new methods of Sort feature added	Core

				src/lancs/mobilemedia/core/ui/screens/AlbumListScreen.java	Format change, comments	Core
				media/core/ui/screens/NewAlbumScreen.java → ...media/core/ui/screens/NewLabelScreen.java	Class name changed, one field changed, three fields added, two method signatures changed, one method deleted, three methods added	Core
				src/lancs/mobilemedia/core/ui/screens/PhotoListScreen.java	One field added, one new field of Sort feature added, two methods deleted	Core, Sort
				src/lancs/mobilemedia/core/util/Constants.java	One field changed	Core
				src/lancs/mobilemedia/core/util/ImageUtil.java	New core and feature code added not visible in UML	Core, Sort
3	New feature added to allow users to specify and view their favourite photos	Inclusion of optional feature Favourite	10 (9) changed files with 144 additions and 45 deletions.	src/lancs/mobilemedia/core/ui/MainUIMidlet.java	Format change	/
				src/lancs/mobilemedia/core/ui/controller/BaseController.java	not visible in UML	Favourite
				src/lancs/mobilemedia/core/ui/datamodel/AlbumData.java	Format change, comments	Core
				src/lancs/mobilemedia/core/ui/datamodel/ImageAccessor.java	Format change, comments	Core
				src/lancs/mobilemedia/core/ui/datamodel/ImageData.	One field and three methods added of feature Favourite	Favourite

				java		
				src/lancs/mobilemedia/core/ui/screens/AlbumListScreen.java	Comments	Core
				src/lancs/mobilemedia/core/ui/screens/PhotoListScreen.java	Two fields of feature Favourite added	Favourite
				src/lancs/mobilemedia/core/util/Image Util.java	Core (comment added) & Favourite extended	Core, Favourite
4	New feature added to allow users to keep multiple copies of photos	Inclusion of optional feature Copy	17 (16) changed files with 1,067 additions and 643 deletions.	src/lancs/mobilemedia/core/ui/MainUIMidlet.java	Fields of core added	Core
				src/lancs/mobilemedia/core/ui/controller/AbstractController.java	One class of core added	Core
				src/lancs/mobilemedia/core/ui/controller/AlbumController.java	One class of core added	Core
				src/lancs/mobilemedia/core/ui/controller/BaseController.java	Many deletions, variability from class is removed	Sort, Favourite
				src/lancs/mobilemedia/core/ui/controller/ControllerInterface.java	Two method signatures of core changed	Core
				src/lancs/mobilemedia/core/ui/controller/PhotoController.java	Sort and Favourite in core code added (not visible in UML)	Sort, Favourite

				src/lancs/mobilemedia/core/ui/controller/PhotoListController.java	Class added with core code including feature Sort involving Favourite	Core, Sort, Sort && Favourite
				src/lancs/mobilemedia/core/ui/controller/PhotoViewController.java	Class added for feature Copy entirely	Copy
				src/lancs/mobilemedia/core/ui/controller/ScreenSingleton.java	Class added	Core
				src/lancs/mobilemedia/core/ui/datamodel/AlbumData.java	One method added for feature Copy	Copy
				src/lancs/mobilemedia/core/ui/datamodel/ImageAccessor.java	One method added for feature Copy	Copy
				src/lancs/mobilemedia/core/ui/datamodel/ImageData.java	Comments	Core
				src/lancs/mobilemedia/core/ui/screens/AddPhotoToAlbum.java	Methods added to core	Core
				src/lancs/mobilemedia/core/ui/screens/AlbumListScreen.java	Comments	Core
				src/lancs/mobilemedia/core/ui/screens/PhotoViewScreen.java	One method added for feature Copy	Copy

				src/lancs/mobilemedia/core/util/ImageUtil.java	One method added for feature Copy	Copy
5	New feature added to send photo to other users by SMS	Inclusion of optional feature SMS	20 (19) changed files with 952 additions and 31 deletions.	src/lancs/mobilemedia/core/comms/BaseMessaging.java	Class added to feature includeSmsFeature entirely	SMS
				src/lancs/mobilemedia/core/ui/MainUIMidlet.java	Code added for feature SMS, not visible in UML	SMS
				src/lancs/mobilemedia/core/ui/controller/PhotoController.java	Code added for feature SMS, not visible in UML. Core changes visible	SMS
				src/lancs/mobilemedia/core/ui/controller/PhotoListController.java	Comments	Core
				src/lancs/mobilemedia/core/ui/controller/PhotoViewController.java	class added for Copy || SMS entirely	Copy || SMS
				src/lancs/mobilemedia/core/ui/datamodel/AlbumData.java	Method added	Core
				src/lancs/mobilemedia/core/ui/datamodel/ImageAccessor.java	Two methods added to SMS in core file	SMS
				src/lancs/mobilemedia/core/ui/screens/AddPhotoToAlbum.java	One field and two methods added to SMS in core file	SMS

				src/lancs/mobilemedia/core/ui/screens/AlbumListScreen.java	Comments	Core
				src/lancs/mobilemedia/core/ui/screens/NewLabelScreen.java	Format, comments	Core
				src/lancs/mobilemedia/core/ui/screens/PhotoViewScreen.java	Two methods of Copy changed to Copy || SMS; two methods for SMS added	(Copy || SMS), SMS
				src/lancs/mobilemedia/core/util/Constants.java	Comments	Core
				src/lancs/mobilemedia/core/util/Image Util.java	Comments	Core
				src/lancs/mobilemedia/sms/NetworkScreen.java	Class added (with 3 methods) for SMS	SMS
				src/lancs/mobilemedia/sms/SmsMessaging.java	Class added (with 10 methods) for SMS	SMS
				rc/lancs/mobilemedia/sms/SmsReceiverController.java	Class added (with 2 methods) for SMS	SMS
				src/lancs/mobilemedia/sms/SmsReceiverThread.java	Class added (with 2 methods) for SMS	SMS
				src/lancs/mobilemedia/sms/SmsSenderController.java	Class added (with 1 method) for SMS	SMS
				src/lancs/mobilemedia/sms/SmsSenderThread.java	Class added (with 6 methods) for SMS	SMS

General Comments

Revision	Comment
0	Empty project
1	Only Core features exist, grouped into one Core feature
2	Sort is both contained in elements of Core and uses elements defined in Core (see e.g. file ImageUtil.java). Label is a challenge because as a mandatory feature it is not annotated and mixed with Core. Core could not be internalized in this revision, because ground truth did not allow us to separate it from Label.
3	Favourite is both contained in elements of Core and uses elements defined in Core (see e.g. file ImageUtil.java)
4	Copy is both contained in elements of Core and uses elements defined in Core (see e.g. file AlbumData.java)
5	SMS is both contained in elements of Core and uses elements defined in Core (see e.g. file MainUIMidlet.java). SMS depends on Copy because in file PhotoViewController.java on Line 114 (getAlbumData().addImageData(photoname, img, albumname);) belonging to feature SMS calls method addImageData(...) of Type AlbumData in file AlbumData.java that belongs to feature Copy. This dependency is missing in the feature model which allows four valid configurations with invalid implementation (all those configurations with feature SMS and without feature Copy)