

1. [Optimizing color consistency in photo collections](#)

ผู้แต่ง: Yoav HaCohen, Eli Shechtman, Dan B. Goldman, and Dani Lischinski

วารสาร: ACM Transactions on Graphics (TOG) - SIGGRAPH 2013 Conference Proceedings, Volume 32 Issue 4, July 2013, Article 38

**Abstract:** With dozens or even hundreds of photos in today's digital photo albums, editing an entire album can be a daunting task. Existing automatic tools operate on individual photos without ensuring consistency of appearance between photographs that share content. In this paper, we present a new method for consistent editing of photo collections. Our method automatically enforces consistent appearance of images that share content without any user input. When the user does make changes to selected images, these changes automatically propagate to other images in the collection, while still maintaining as much consistency as possible. This makes it possible to interactively adjust an entire photo album in a consistent manner by manipulating only a few images.

Our method operates by efficiently constructing a graph with edges linking photo pairs that share content. Consistent appearance of connected photos is achieved by globally optimizing a quadratic cost function over the entire graph, treating user-specified edits as constraints in the optimization. The optimization is fast enough to provide interactive visual feedback to the user. We demonstrate the usefulness of our approach using a number of personal and professional photo collections, as well as internet collections.

2. [Online modeling for realtime facial animation](#)

ผู้แต่ง: Sofien Bouaziz, Yangang Wang, and Mark Pauly

วารสาร: ACM Transactions on Graphics (TOG) - SIGGRAPH 2013 Conference Proceedings, Volume 32 Issue 4, July 2013, Article 40

**Abstract:** We present a new algorithm for realtime face tracking on commodity RGB-D sensing devices. Our method requires no user-specific training or calibration, or any other form of manual assistance, thus enabling a range of new applications in performance-based facial animation and virtual interaction at the consumer level. The key novelty of our approach is an optimization algorithm that jointly solves for a detailed 3D expression model of the user and the corresponding dynamic tracking parameters. Realtime performance and robust computations are facilitated by a novel subspace parameterization of the dynamic facial expression space. We provide a detailed evaluation that shows that our approach significantly simplifies the performance capture workflow, while achieving accurate facial tracking for realtime applications.

### [3. Weighted averages on surfaces](#)

ผู้แต่ง: Daniele Panozzo, Ilya Baran, Olga Diamanti, and Olga Sorkine-Hornung

วารสาร: ACM Transactions on Graphics (TOG) - SIGGRAPH 2013 Conference Proceedings, Volume 32 Issue 4, July 2013, Article 60

**Abstract:** We consider the problem of generalizing affine combinations in Euclidean spaces to triangle meshes: computing weighted averages of points on surfaces. We address both the *forward problem*, namely computing an average of given anchor points on the mesh with given weights, and the *inverse problem*, which is computing the weights given anchor points and a target point. Solving the forward problem on a mesh enables applications such as splines on surfaces, Laplacian smoothing and remeshing. Combining the forward and inverse problems allows us to define a correspondence mapping between two different meshes based on provided corresponding point pairs, enabling texture transfer, compatible remeshing, morphing and more. Our algorithm solves a single instance of a forward or an inverse problem in a few microseconds. We demonstrate that anchor points in the above applications can be added/removed and moved around on the meshes at interactive framerates, giving the user an immediate result as feedback.

### [4. MADMatch: Many-to-Many Approximate Diagram Matching for Design Comparison](#)

ผู้แต่ง: Kpodjedo, S.; Ricca, F.; Galinier, P.; Antoniol, G.; Gueheneuc, Y.-G.

วารสาร: IEEE Transactions on Software Engineering, Volume 39, Issue 8, Aug. 2013, Page 1090-1111

**Abstract:** Matching algorithms play a fundamental role in many important but difficult software engineering activities, especially design evolution analysis and model comparison. We present MADMatch, a fast and scalable many-to-many approximate diagram matching approach based on an error-tolerant graph matching (ETGM) formulation. Diagrams are represented as graphs, costs are assigned to possible differences between two given graphs, and the goal is to retrieve the cheapest matching. We address the resulting optimization problem with a tabu search enhanced by the novel use of lexical and structural information. Through several case studies with different types of diagrams and tasks, we show that our generic approach obtains better results than dedicated state-of-the-art algorithms, such as AURA, PLTSDiff, or UMLDiff, on the exact same datasets used to introduce (and evaluate) these algorithms.

### [5. Monitor-Based Instant Software Refactoring](#)

ผู้แต่ง: Hui Liu; Xue Guo; Weizhong Shao

วารสาร: IEEE Transactions on Software Engineering, Volume 39, Issue 8, Aug. 2013, Page 1112-1126

**Abstract:** Software refactoring is an effective method for improvement of software quality while software external behavior remains unchanged. To facilitate software refactoring, a number of tools have been proposed for code smell detection and/or for automatic or semi-automatic refactoring. However, these tools are passive and human driven, thus making software refactoring dependent on developers' spontaneity. As a result, software engineers with little experience in software refactoring might miss a number of potential refactorings or may conduct refactorings later than expected. Few refactorings might result in

poor software quality, and delayed refactorings may incur higher refactoring cost. To this end, we propose a monitor-based instant refactoring framework to drive inexperienced software engineers to conduct more refactorings promptly. Changes in the source code are instantly analyzed by a monitor running in the background. If these changes have the potential to introduce code smells, i.e., signs of potential problems in the code that might require refactorings, the monitor invokes corresponding smell detection tools and warns developers to resolve detected smells promptly. Feedback from developers, i.e., whether detected smells have been acknowledged and resolved, is consequently used to optimize smell detection algorithms. The proposed framework has been implemented, evaluated, and compared with the traditional human-driven refactoring tools. Evaluation results suggest that the proposed framework could drive inexperienced engineers to resolve more code smells (by an increase of 140 percent) promptly. The average lifespan of resolved smells was reduced by 92 percent. Results also suggest that the proposed framework could help developers to avoid similar code smells through timely warnings at the early stages of software development, thus reducing the total number of code smells by 51 percent.

## 6. [Balancing Privacy and Utility in Cross-Company Defect Prediction](#)

ผู้แต่ง: Peters, F. ; Menzies, T. ; Gong, L. ; Zhang, H.

วารสาร: IEEE Transactions on Software Engineering, Volume 39, Issue 8, Aug. 2013, Page 1054-1068

**Abstract:** Background: Cross-company defect prediction (CCDP) is a field of study where an organization lacking enough local data can use data from other organizations for building defect predictors. To support CCDP, data must be shared. Such shared data must be privatized, but that privatization could severely damage the utility of the data. Aim: To enable effective defect prediction from shared data while preserving privacy. Method: We explore privatization algorithms that maintain class boundaries in a dataset. CLIFF is an instance pruner that deletes irrelevant examples. MORPH is a data mutator that moves the data a random distance, taking care not to cross class boundaries. CLIFF+MORPH are tested in a CCDP study among 10 defect datasets from the PROMISE data repository. Results: We find: 1) The CLIFFed+MORPHed algorithms provide more privacy than the state-of-the-art privacy algorithms; 2) in terms of utility measured by defect prediction, we find that CLIFF+MORPH performs significantly better. Conclusions: For the OO defect data studied here, data can be privatized and shared without a significant degradation in utility. To the best of our knowledge, this is the first published result where privatization does not compromise defect prediction.

## 7. [Evolution of Social Networks Based on Tagging Practices](#)

ผู้แต่ง: Kim, Hak-Lae ; Breslin, John G. ; Chao, Han-Chieh ; Shu, Lei

วารสาร: IEEE Transactions on Services Computing, Volume 6, Issue 2, April-June 2013, page 252-261

**Abstract:** Websites that provide content creation and sharing features have become quite popular recently. These sites allow users to categorize and browse content using “tags” or free-text keyword topics. Since users contribute and tag social media content across a variety of social web platforms, creating new knowledge from distributed tag data has become a matter of performing various tasks, including publishing, aggregating, integrating, and republishing tag data. In this paper, we introduce

an object-centered social network based on tagging practices across different sources, and then we show how this network can be built and emerged over time.

#### 8. [Finding the Optimal Social Trust Path for the Selection of Trustworthy Service Providers in Complex Social Networks](#)

ผู้แต่ง: Liu, Guanfeng ; Wang, Yan ; Orgun, Mehmet A. ; Lim, Ee-Peng

วารสาร: IEEE Transactions on Services Computing, Volume 6, Issue 2, April-June 2013, page 152-167

**Abstract:** Online Social networks have provided the infrastructure for a number of emerging applications in recent years, e.g., for the recommendation of service providers or the recommendation of files as services. In these applications, trust is one of the most important factors in decision making by a service consumer, requiring the evaluation of the trustworthiness of a service provider along the social trust paths from a service consumer to the service provider. However, there are usually many social trust paths between two participants who are unknown to one another. In addition, some social information, such as social relationships between participants and the recommendation roles of participants, has significant influence on trust evaluation but has been neglected in existing studies of online social networks. Furthermore, it is a challenging problem to search the optimal social trust path that can yield the most trustworthy evaluation result and satisfy a service consumer's trust evaluation criteria based on social information. In this paper, we first present a novel complex social network structure incorporating trust, social relationships and recommendation roles, and introduce a new concept, Quality of Trust (QoT), containing the above social information as attributes. We then model the optimal social trust path selection problem with multiple end-to-end QoT constraints as a Multiconstrained Optimal Path (MCOP) selection problem, which is shown to be NP-Complete. To deal with this challenging problem, we propose a novel Multiple Foreseen Path-Based Heuristic algorithm MFPB-HOSTP for the Optimal Social Trust Path selection, where multiple backward local social trust paths (BLPs) are identified and concatenated with one Forward Local Path (FLP), forming multiple foreseen paths. Our strategy could not only help avoid failed feasibility estimation in path selection in certain cases, but also increase the chances of delivering a near-optimal solution with high quality- The results of our experiments conducted on a real data set of online social networks illustrate that MFPB-HOSTP algorithm can efficiently identify the social trust paths with better quality than our previously proposed H\_OSTP algorithm that outperforms prior algorithms for the MCOP selection problem.

#### 9. [Model Checking Higher-Order Programs](#)

ผู้แต่ง: Naoki Kobayashi

วารสาร: Journal of the ACM, Volume 60 Issue 3, June 2013, Article No. 20

**Abstract:** We propose a novel verification method for higher-order functional programs based on higher-order model checking, or more precisely, model checking of higher-order recursion schemes (recursion schemes, for short). The most distinguishing feature of our verification method for higher-order programs is that it is sound, complete, and automatic for the simply typed  $\lambda$ -calculus with recursion and finite base types, and for various program verification problems such as reachability, flow analysis, and resource usage verification. We first show that a variety of program verification problems can be reduced to model

checking problems for recursion schemes, by transforming a program into a recursion scheme that generates a tree representing all the interesting possible event sequences of the program. We then develop a new type-based model-checking algorithm for recursion schemes and implement a prototype recursion scheme model checker. To our knowledge, this is the first implementation of a recursion scheme model checker. Experiments show that our model checker is reasonably fast, despite the worst-case time complexity of recursion scheme model checking being hyperexponential in general. Altogether, the results provide a new, promising approach to verification of higher-order functional programs.

#### 10. [Composite proximal bundle method](#)

ผู้แต่ง: Claudia Sagastizábal

วารสาร: Mathematical Programming, Volume 140, Issue 1, August 2013, Page 189-233

**Abstract:** We consider minimization of nonsmooth functions which can be represented as the composition of a positively homogeneous convex function and a smooth mapping. This is a sufficiently rich class that includes max-functions, largest eigenvalue functions, and norm-1 regularized functions. The bundle method uses an oracle that is able to compute separately the function and subgradient information for the convex function, and the function and derivatives for the smooth mapping. With this information, it is possible to solve approximately certain proximal linearized subproblems in which the smooth mapping is replaced by its Taylor-series linearization around the current serious step. Our numerical results show the good performance of the Composite Bundle method for a large class of problems.