Conversational Composites: A Method for Illustration Layering

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Mafalda Gamboa
Interaction Design, CSE, Chalmers University of Technology, University of Gothenburg
Gothenburg, Sweden
mafalda.gamboa@chalmers.se

Sara Ljungblad
Interaction Design, CSE, Chalmers University of Technology, University of Gothenburg
Gothenburg, Sweden
sara.ljungblad@chalmers.se

Miriam Sturdee
Lancaster University
School of Computing and Communications
Lancaster, UK
m.sturdee@lancaster.ac.uk

ABSTRACT
The conversational nature of sketches is a widespread topic of research. Understanding drawing as a cognitive activity is commonly accepted, and many of the most extensively used methods within Human-Computer Interaction recruit sketching as a technique for ideation, explanation, documentation, and conversation. To further develop the use of this illustration process as a tool of knowledge production, we suggest a novel sketching method. We present *Conversational Composites*: a flexible method grounded in the material and tangible qualities of sketching in different forms and media, creating physical and digital layers of conversation between participants. We present and reflect on the proposed method through an applied case of a conversation between a PhD student and her supervisor, and offer suggestions on how it may be adapted and appropriated by other researchers in the HCI community.

Authors Keywords
illustration; sketching; design methods; drones

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CSS Concepts
• Human-centered computing~Human computer interaction (HCI)

INTRODUCTION

The nature of drawing – in this case sketching and illustration – is dependent on the tangible characteristics of the material used. The media defines the possible vocabulary and determines the spectrum of afforded drawing conversations. For example, drawing on a white board with a pen is entirely different from drawing on paper with brush and ink. In this pictorial, we present a method developed to take advantage of the tangible facet of sketching to guide and support illustrated dialogues between participants in a project. Our method is reminiscent of *exquisite corpse*, a technique invented by surrealists, where a sequence of images is collectively constructed. In exquisite corpse, each participant draws a fragment of a composition, and proceeds to fold the piece of paper so the next participant can continue without being able to see the earlier fragments. In the same spirit, we developed a method to support conversations through transparency, where each participant is allowed to see and build upon earlier fragments by using layers of different drawing media.

While verbal and written communication is key in most human exchanges, we offer a method that complements group or pair discussions by scaffolding the expression of ideas, opportunities, and concerns in a format that requires interpretation and purposefully incorporates subjectivity rather than clarity. Sketching is already a widely used technique within Human-Computer Interaction for design work [2, 4].

Still, there is a need for design research methods to be open to alternative and accessible forms of interrogation and future enquiry, engaging in the complexity of design practice [18], and including personal experiences [23]. In this pictorial, we contribute to the HCI and TEI community through a method that relies heavily on the tangible facets of drawing as a generative and collaborative technique.

BACKGROUND

The 'sketch' can encompass many forms, domains and purposes, from a small piece of comedy or a piece of programming code, to a technical diagram, or, as we present in this conversation, an image using artistic media, specifically watercolour paint, which with its fluid nature allows free-form expression, and serendipitous discovery in examination of a particular piece of technology.

Sketching in Technological Enquiry

Sketching within computer science and specifically, within Human Computer Interaction provides a lo-fidelity, accessible (in terms of availability) and low cost method of designing both applications and tangible devices, surfaces and spaces, but also the interactions for them [14, 20]. It offers more than a few sentences of textual description, and can scaffold conversations by allowing individuals to realise their ideas in a multi-modal way. Sketching also allows us to work with real people, who may not have 'expert knowledge' but can use sketching to make visible the interactions from their imaginations, as part of an iterative, collaborative, design process [11].

Although primarily existing within the 2D space, paper sketches allow us glimpses of shapes and ergonomics, and complex, 3D objects can be realised, and in some form, prototyped via this method to future-proof initial designs by working through the complexities of a build in this visual, shareable space.

Sketching as Dialogue

Sketching is a rich form of visual communication, with roots as far back as preliterate civilisation. Whereas this kind of imagery can be realised for consumption alone – often a one way process – it also invites response, and these responses can take many forms, such as interrogation and iteration, continuation or reaction in other media. The 'loose' nature of sketching has often been explained as a metaphor for invitation [22], where an image remains unfinished or purposefully ambiguous.

FIGURE 1

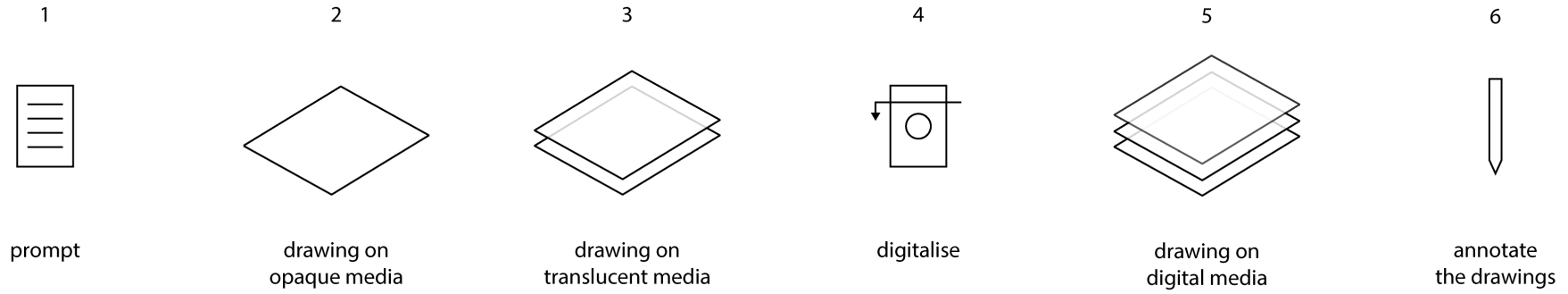

FIGURE 2

In this way, sketching can also become a form of dialogue [10], a conversation between researchers [15] or artists [19] and designers [8, 12]. These dialogues can create unexpected and inspiring imagery [g], and whilst grounded in a research question or starting point, can also inform us in varied and unexpected ways. As an example, Koulidou et al. [13] explore themes of displacement and lived experiences via a dialogical sketching process, a multi-layered approach where original drawings are used as a basis for deeper enquiry. Others have used sketching as a subjective process, a conversation within themselves [7] but equally also available to read and respond to as research articles.

Developing the Method

The method of conversation presented in this pictorial was created as a submission to a conference's workshop [22]. The workshop's aim included developing "visual dialogues resulting from the merging of drawings created by different people" [22]. This idea is grounded on Yurman's Drawing Conversations [21], a method where watercolour is used in its ambiguous capacity to create collaborative visual conversations between participants "drawing in partnership", creating evolutions between drawings. The method is about playful reinterpretation of artefacts leading to speculative designs. To fit the call for papers, we imagined a method which would allow us to find research interests in an unfamiliar conversation using drawing. Grounded on Fluid Speculations [21], we decided to create a sequence of layers that would allow us, through contrasting artistic characteristics, to build on each other's ideas, making it possible to identify each layer as a separate part, yet view them as a cumulative and meaningful sum. Hence, we decided we needed to depart from a specific prompt, and through drawing arrive at a renewed understanding of our research problem or artefact. Figure 2 shows the abstract steps of the method as envisioned.

This *Conversational Composites* method differs from existing uses of the exquisite corpse in HCI (e.g. as a direct homage, but utilising a different technique or domain such as textual enquiry [3], developing 3D interfaces [17]; or exploring interactions through video [5]) – we use it in the original sketch-based and visual form. We also apply the concept of layering rather than folding over and hiding the previous image, to allow for reinterpretation and ambiguity [9] rather than abstract novelty. In this way, the continued reinterpretation focuses on the chosen topic but allows for creativity, which in turn affords insight and ideation. In this way we also differ from Yurman's approach [21] as there is one starting point, rather than two objects of interest. The starting points also differ as unlike Yurman's method, our prompt is not necessarily object- or artefact-oriented. In our method, the process is centred in the building of narratives with less speculation and more emphasis on re-interpretation. Koulidou et al. [13] also makes use of building upon images, yet their work is not hidden, the conversations and image making are open and detailed in their execution, 'shrinking down' each image to draw around, rather than creating layers of the same size.

None of the techniques we use are new, but their blending creates a new design space, which could be applied to other topics, and even re-imagined in different materials. We build upon the work of others to view design and research issues through a new tangible lens – layered narrative prototyping.

CONVERSATIONAL COMPOSITES

Conversational composites relies on a sequential exchange of sketches and drawings between participants. Unlike other sketching methods, we rely on the tangible construction and possible deconstruction

of the composite, incorporating traceability of each participant's interpretations and perspectives. The notion of a composite material is central to the definition of our method: the produced artefacts should have distinct layers with their particular identity, while still contributing to the whole. The method can be applied from one participant to as many as the layers accommodate. As described in Figure 5, a prompt is a necessary starting point for a conversational composite. We suggest as potential prompts:

- **Research questions**
- **Requirements**
- **Stories**
- **Photos of events**
- **User quotes**
- **Diary entries**
- **Design artefacts**
- **Design guidelines**
- **Manifestos**

After picking an appropriate prompt for conversation, the layers of the composite must be defined. This method can be applied from one participant to as many as the layers accommodate. For each layer it is important to rely on the tangible and material characteristics of the chosen media and technique. For example, when using translucent paper, watercolour is likely not a suitable technique. We suggest the following sequence of layers as represented in Figure 4:

(1) opaque media with fluid technique

(2) translucent media with line drawing

(3) digital media with pen on screen

FIGURE 3

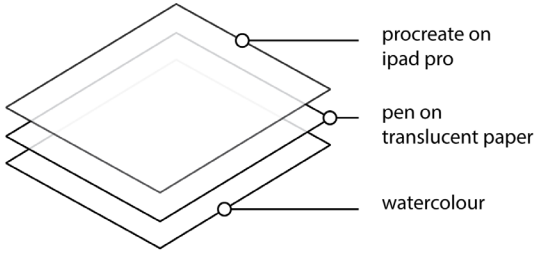

FIGURE 4

The method relies on each layer being created, and exchanged with the next participant. Each step should thus build on the previous content, and take advantage of the media and technique of the current layer. Lastly, the participants should annotate each of the layers they were responsible for, and grounded in their reflections, discuss new insights to feed into the starting prompts.

We suggest that the participants read each other's annotations, and thereafter discuss and describe the composite as a whole, for example by noticing what changes between layers, what parts of each image were built upon, redrawn, ignored, or left untouched. The method also gives the opportunity to dissect the composite by considering each layer on its own, and even reshuffling the order of the layers in search for new meanings.

We imagine *conversational composites* as a method that supports interdisciplinary collaboration, aiding in flattening hierarchies, and allowing for design and research discussions to take place in alternative forms to trigger novel and deepened understanding of the research. The ambiguity afforded, and the equal balance in the influence of each participant, makes for a rich conversation which can be generative at levels beyond speech or text. The last step of this method guarantees the composite is analysed and discussed, being re-interpreted in a conversation. The composite can then be seen as whole, and an analysis of which of the elements are visible through the layers, and which are allowed to fade is an important part of the process.

Applied Method

Below, we present a description of the method as applied by two of the authors: a PhD student (Mafalda) and her Supervisor (Sara). In our case, we used as prompts a set of micro-stories gathered through an online questionnaire (note the blue pieces of paper on Figure 1). Our research interest lies with drones, and we recruited respondents through an online social media group. The group is dedicated to hobby drone piloting. The questionnaire was of a very simple nature, prompting them to report on any accident, or special incident, they may have experienced with their drones, without providing any particular limits on the length of the text. We then used their narratives as the starting point for a conversation in drawings between us: two researchers working in the same Research through Design project on Social Drones. Our process was as follows: we read all the stories and picked three each. Then, we interpreted the chosen stories in watercolour (A1-F1). The choice of watercolour as the starting layer was inspired by Yurman [21], but also because the ambiguous quality of the liquid was a desirable characteristic to start a conversation. After this, we exchanged drawings and built on the watercolour with a layer of transparent paper and black pen (A2-F2). We then scanned the combination of watercolour and pen. Finally, the original painter had a chance to add a digital layer to the composite using an iPad pro and Procreate (A3-F3). Finally, we annotated each of the drawings, and discussed new insights on our research goals. Throughout this process, we exchanged no words, but had expectations on what the other would draw. In the following pages, we show each of the 6 prompts, drawings, and annotations generated.

In our application of the method we found that:

• We intentionally left space for each other in the drawing. For example, an empty hand was intended to be filled.

• Drawings are ambiguous. Misinterpretation was easily pinpointed in the discussions, but affected the next drawing in the process. For example, one drawing was accidentally turned upside down in the second layer, which was reversed in the third layer. Since the initial text story was shared, the interpretation still made sense.

• Each media afforded different types of representation in every layer: watercolour would set the overall scenery, and pen and digital sketching would be used for details.

• The layering allowed us to bring back elements and intentions from earlier drawings as perspectives of time, events, background, and foreground shifted.

• It was a fun, playful, and relaxing way to engage with research data.

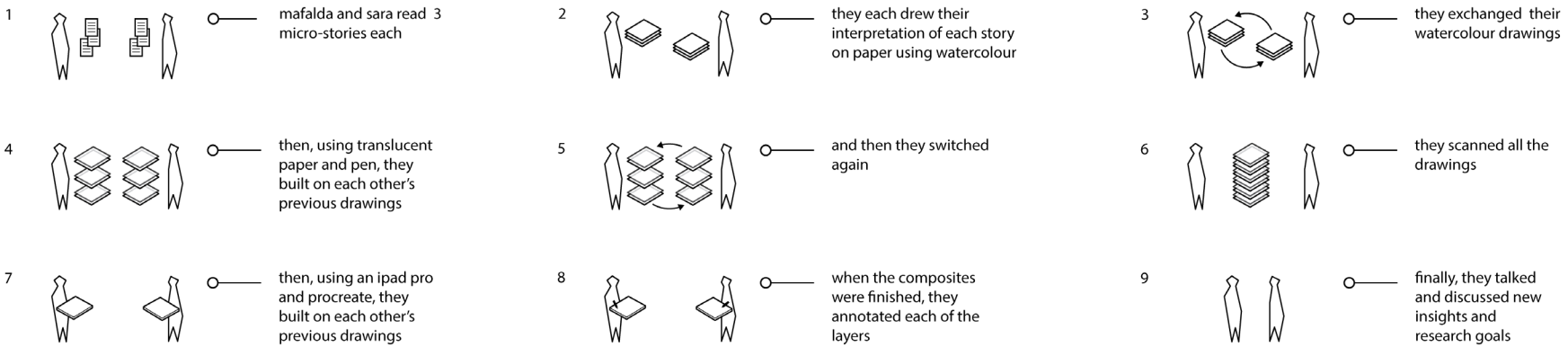

FIGURE 5

"It flew away. I used the app litchi and had created a route it would follow, but it never came back. It turned out that I did not think that the stated height is in relation to the starting point and when the ground rose, it came closer and closer to the ground and finally stopped in front of a large spruce and did not know where it would go. There it hovered until the batteries ran out. A resident in the area found it after 1 1/2 years and when I checked the film on the memory card it was clear what had happened."

A1 / Mafalda: I wanted to illustrate the woods and the found small drone, and wanted to leave space for the passage of time to be made clearer as a layer in the next drawings. In the corner, I added a device being held in the hands of a user.

A2 / Sara: I wanted to create a reaction among the trees to show that the drone without its pilot is a strange phenomena in the woods. I sketched a new tree as an individual with eyes, and a drone that appears stuck in front of it. I wanted the tree to look confused and have a slightly sad look. The idea was to make this scene with the looking tree foreground, a living creature that is affected by the lost drone.

A3 / Mafalda: I was surprised to see that the image in the corner and the the actual woods were not part of this new layer. The new drawing built very little on the initial one, but brought into the story the big spruce. This reminded me of the agency of different materials in nature. The big spruce I had first ignored had a somewhat surprised expression, but I imagined that if all these drones kept colliding with it, as time passed, it would be harder and harder to know where the forest ends and the drone cemitery begins. The one human that found the drone fades further and further into the background.

"Unpleasant experiences where large metal objects under the ground or in the form of a large crane affected the drone's compass so it gave of itself and could not be steered. Should almost be on the drone map so more people will be aware of this. There are items near bridges and at metal ports under the ground that always cause major problems."

B1 / Mafalda: I drew a bridge in black with large areas of metal around it and under it. I made this drawing rather abstract on purpose and imagined the next step would be to consider the map and how there are hidden worlds beyond the visible to consider when piloting drones.

B2 / Sara: I interpreted the sketch as an abstract expression of magnetic fields. I overlaid them with a drone, flying in a small circle to show that it is affected by the magnetic fields.

B3 / Mafalda: Sara had turned my drawing upside down! She did not perceive the black as a bridge, and drew what looked to me as a lost drone. In this digital layer, I hid all the previous traces of the metal as a layer under the earth, only marked by crosses on a map. But the world under it is upside down now. Which one is the real one, does it matter for the drone? The drone itself does not know what a bridge means.

"I'm on my 5th drone. I have crashed three drones and that is of course due to the way I use the drone. My drone is a camera dolly and the best movie clip is when you drive backwards and sideways. Unfortunately, you do not see in the direction of travel either. I usually film my grandson, who engages in kite surfing and kite foiling, 2-3 m above the water is usually the best and safest, but sometimes you end up below 1 m and then there is a crisis."

C1 / Sara: I painted a diver coming up from the water with an empty hand in the air. I intended Mafalda to continue the story of how a drone got lost in the water and potentially add a drone in the divers hand.

C2 / Mafalda: I thought this drawing of the diver was beautiful and it seemed very clear to me Sara was leaving an open hand for me to fill with a drone. However, as I did that, the paper moved and I saw how the transparent layer could be used as a dual-meaning layer, of the drone in the hand and at the same time the drone in the air getting tangled in the threads of the kite. I left the drawing without much detail and expected Sara would build on this travelling of the drone in the air and the drone under water as simultaneous states. What if the drone could dive, like a bird catching fish?

C3 / Sara: I made the drone appear like it just got out of the water entangled with green seaweed. I also make the arm and the hand of the diver more prominent in the picture, so that this becomes the primary focal point. I had an idea of adding some fish in the water, but decided not to. I added some color to the windsurfing sail to make it appear livelier.

"One fine spring day I was going out with my newly bought drone. Just as I am about to take off and fly away with the drone, I see a large eagle just above me circulating around me. Almost like it was waiting to put its claws on. Do you think it was a ride after that shock? Nope!"

D1 / Sara: I painted an eagle that is circling over a drone on the ground. I leave some space for Mafalda to add a person. I imagind adding a person that looks scared and is squatting next to the drone, maybe protecting their head?

D2 / Mafalda: The superhuman capacity of the drone brought the human closer to nature. But nature won this fight, so I tried to expand the story and show a sequence of the human seeing through the drone, almost touching the eagle. And after this exciting experience, a drone gathering dust on a shelf.

D3 / Sara: I was not sure what to draw first. I make the eagle more prominent. Then I draw a box to illustrate that the drone will be put back in its box. Somehow I did not see the face that Mafalda had drawn first. Then I saw it, and focus on making it more prominent.

"Meant to lift from a table on a small bridge. Had run the same sequence last autumn but now it was winter and wanted the same bit in winter but did not want footprints in the snow so flew into the place. When I took off I hit a branch and the drone bounced around in a birch... the propellers broke partly but managed to steer it down with difficulty and crashed on the small bridge and not in the water. Everything is on film."

E1 / Mafalda: The passage of time, the two seasons told in this story felt like a beautiful poem. The pilot wanted to catch the same space in two different conditions, just as we wanted to draw multiple layers. I drew the bridge and the river in an anonymous landscape, with traces of winter and of falling autumn leaves in the corner.

E2 / Sara: I interpreted the painting to have a bridge that is far away. I was not sure what the brown drops are. I sketched a large tree on the side with a branch that a drone is stuck on. There was some snow on the tree. I also sketched some footprints and snow. Avoiding footprints in the story was a potential reason for the drone mishap, so I figured that their existence in the painting is an important part of the story.

E3 / Mafalda: As I got this drawing back, I saw the drone now in a much closer frame. In the digital layer I brought back the mixture of autumn and winter, and pondered on how the drone was unchanged. Its skin the same between the seasons, its metal body not a part of the organic elements of nature, a stark contrast. Even the footsteps of the human would have been a natural part of this landscape.

"A family became interested when I flew my drone before. At about the same place a few months later, an angry man came and said that he would shoot down the drone if I flew over his house."

F1 / Sara: I painted a farmer standing in front of his house. Initially the arms were crossed, but open arms worked better to signal that the farmer says "stop!" I deliberately left space for Mafalda to continue the story.

F2 / Mafalda: This story reminded me of a game I played last year called "Untitled Goose Game". The idea of the man against the drone was already put in a humorous tone, but I imagined the man would create a sign to send to all drones and place it outside his house, just as one would warn about a guardian dog. The design of this signage would be an interesting topic of research. I speculated on the roles of other creatures in this scenario, and their interplay in negotiating the privacy of space.

F3 / Sara: Overall, I was not sure what to add in the picture, more than making the existing objects more vivid through colour. I made the "no drones" sign colorful and prominent with red paint. I added color to the dog, the rifle and to the farmer. I also added an angry expression on his face.

DISCUSSION

The use of the method opened up for discussions on new research directions. We were surprised to experience how refreshing the silent discussions were, and how they supported a visual understanding of the importance we gave to each topic or agent represented. For example, Mafalda, the PhD Student, found that there was a greater emphasis on the more-than-human elements of human-drone interaction. In her view, this revealed a need to revise the research questions and ponder if the considered stakeholders were too limited – were the trees and birds included? Or, the underwater creatures when a drone collapsed in the sea? From Sara's perspective, who had been painting watercolour in her spare time for many years, this was an enjoyable, intuitive, and playful approach to research, and to jointly reflect on user data. Bringing user stories to life by taking turns in interpreting them and continuing on each other's drawings was a new experience – different from other methods of qualitative data analysis we had previously used such as thematic analysis or coding. We considered how the method could support preserving the privacy of the users while depicting ethically questionable situations (such as dangerous or illegal actions).

We have yet try the technique with another prompt (e.g. research questions, design guidelines, manifestos), but we see a promising aspect in the layering of media and the conversation the space of the paper affords. The method is relatively flexible but relying heavily on the physical media – this may mean that a remote application of the method is limited. An advantage of the set-up is that it could be adapted to available tools, prompts, and number of participants. We suggest as future work the development of a collection of possible steps with examples, and departing from the applied use of this collection, evaluate the method with different participants. While previous research has focused on using drawing as mediation in many forms, we focus instead on a sequential conversation in layers where each spoken sentence is an integral part of the final result, and simultaneously, where each step is easily archived due to the tangible nature of the method. *Conversational Composite*s are prepared to take advantage of a panoply of different prompts, from research questions to ethnographic data.

We recognise as a great advantage that the composites are tangible, each layer inviting for a specific type of artistic expression: Figure 6 offers a list of media compatible with the method. The interplay between transparency and opacity is an added value. Opposed to techniques such as presented by Yurman [21], the collaboration our method proposes results in an artefact that is necessarily collaborative – a hybrid of every participant's individual expressions. These types of artefacts produced during the design process are valuable to the research community as the "hidden treasures" [1] now being more widely shown in publication formats such as pictorials. Temporality is also an important material factor: some layers may take longer to settle. In our case, for example, we had to wait for the watercolour layer to dry before adding the next and played with a hair dryer to this end (see Figure 3). This is a characteristic that makes the method particularly compatible with HCI theories where slowness is contemplated (e.g. Slow Technology [16]).

Every method comes, of course, with its drawbacks. We found that not every composite was generative, and that it was difficult to write and facilitate the interpretation of the annotations, as their goal was not always clear. A particularity of this method is that the ambiguous nature of images may shift what is central in the original data towards the margins and vice-versa. We found it conversely more helpful to use the composites as imagery for interdisciplinary input during the workshop, where others could probe our drawings with questions of their own. The method is open for development at the hands of other HCI researchers, and we would invite the conversation to be ongoing. We pinpoint the need to reflect more systematically on the emerging perspectives supported by the method, but also on leaping from the abstraction of drawings towards more specific research directions. We count on the TEI community to be a helping hand in this development.

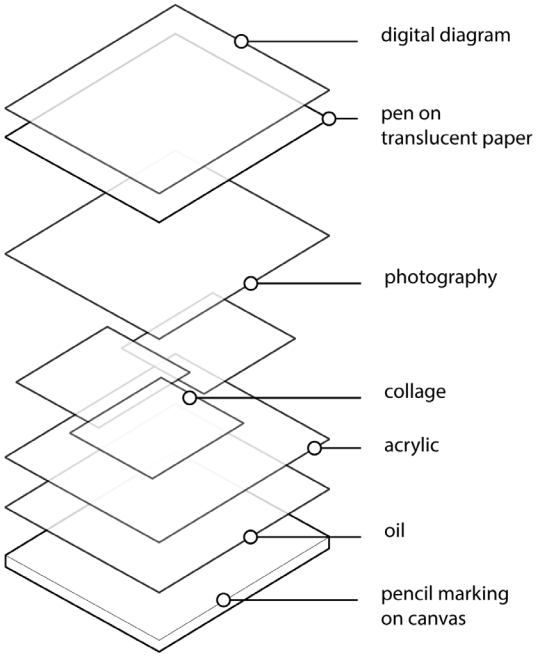

FIGURE 6

CONCLUSION

Drawing – in particular sketching and illustration – is an instrument with growing interest in the HCI community. As the research field develops, the need for methods that accommodate subjective and nuanced conversations is increasing. This pictorial, we present a new method for conversation relying on the tangible characteristics of drawing media – *Conversational Composites*. We introduce the method through an example application between a PhD student and her supervisor, and discuss how it can be further developed and adapted by other researchers. The method builds on the potential of combined drawings as a nuanced space with alternative values for tackling and exploring research data in a tangible way.

ACKNOWLEDGMENTS

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