NEWSLETTER

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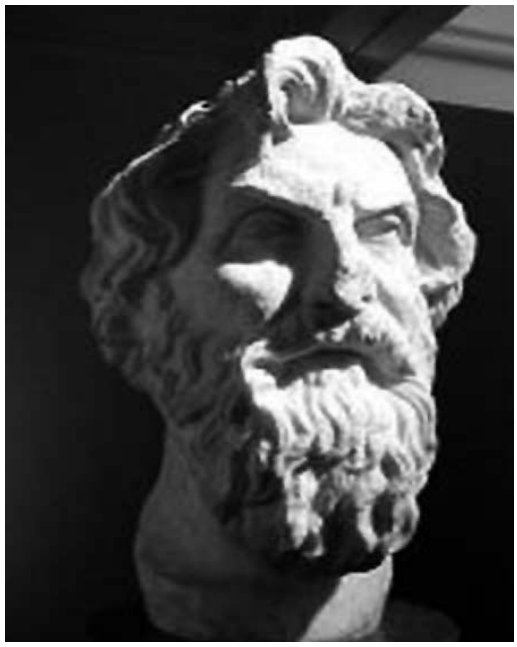

Aristarchus' Visit to Euclid

Plan Repair

ToKeN in Full Swing

News from the Belgium-Netherlands Association for Artificial Intelligence

Present and Future

Editor-in-Chief

Every now and then one has to reconsider the quality of his or her output. This also holds for the BNVKI Newsletter. Therefore, last year the BNVKI-Board has focused among others on the role of the Newsletter as a forum for AI researchers in Belgium and The Netherlands. At last year's BNAIC in Brussels we gathered input from the attendees via a questionnaire. Unfortunately, the results were rather inconclusive. Consequently, the Board of the BNVKI and the Editorial Board of the Newsletter had fruitful discussions and gained as much as possible information from fellow researchers. Variables, among others, were the frequency of the Newsletter, its form (hard copy or electronically), and its contents.

Based on all information the Board feels that the Newsletter in its present form fulfills an important role within the AI community and she has decided consequently to try her utmost (depending on financial means) to keep the Newsletter being published as before.

Concerning the contents, several useful suggestions have been made, which we will use to make the Newsletter even better. Firstly, it was suggested that more Ph.D. thesis abstracts and reviews should be published, in order to spread more the hot topics in AI research. After all, our Ph.D. students form the core of the research community and, even more importantly, are its future. Secondly, the Board has decided to strengthen her ties with students and industry, and the results of this strengthening should be visible in the Newsletter. Concludingly, we as editors shall solicit more news and reports from student events, and industrial research related to AI. Obviously this doesn't mean that you have to await such a solicitation: anyone with relevant information is wholeheartedly invited to submit it to us or to put our attention to it.

Further, after the successful BNAIC conference last year in Brussels, the organization of the 2006 edition is in full swing. The website is open for submissions now and we expect many inspiring contributions. The location will anyway be inspiring, being in the beautiful city of Namur. For more information, see pages 43-45 of this issue.

The Citadel of Namur overlooking the confluence of the Meuse and the Sambre rivers.

Let me conclude to acknowledge all people that contributed to our fruitful discussions, board members, editorial-board members, and anyone who provided us with useful information alike. Thank you and we will strive for an even higher quality of, after all, *your* Newsletter.

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The photographs in this issue are by courtesy of Christiane Klöditz (pp. 38-40) and by the Belgian Tourist Information office (p. 26 and pp. 44-45).

Front cover: Aristarchus (left) and Euclid having a Philosophical View on Geometry (see Henk Visser's article on pp. 28-37).

The deadline for the next issue is: **June 9, 2006**.

BNVKI-Board News

Han La Poutré

The Board of the BNVKI is very proud to announce that Antal van den Bosch, one of the Board members, has been awarded a prestigious VICI grant, by NWO. We congratulate him very much with this big achievement, and we wish him all the best with achieving his research goals by means of this VICI grant.

A brief explanation: a VICI grant is a personal grant by NWO ("Nederlanse Organisatie voor Weten-schappelijk Onderzoek"), which enables senior researchers to start their own research group. It is part of the Veni/Vidi/Vici scheme of NWO, being personal grants for talented young researchers (right after their Ph.D.), experienced researchers, and senior researchers, respectively. The competition for these grants is highly competitive and the awarded grants are very prestigious. So, again, Antal: our congratulations for this!

This award will further enhance the AI research in the Netherlands, and it again acknowledges the quality and place of AI research in the Netherlands and Belgium. More generally, the awards that have been given to AI researchers in recent years are good indications of the quality of our research community (think of, e.g., ECAI fellows, recent awards by the Belgian Academy of Science and the Dutch NWO, and high evaluations of research groups).

With respect to the activities of the Board, I like to mention the following. In the last couple of months, the Board has been pretty busy with the future of the BNVKI (besides the regular daily activities of the Board, which occur every year in a repeated fashion). We have been looking into what the key activities of the BNVKI currently are, and what we think would be the desirable activities in the future. At the moment, we are in the middle of this process. Of course, BNAIC and BNAIS remain important and central for the BNVKI, but we also think of extending other activities and of strengthening the relationships with students. Again, we welcome suggestions and ideas from BNVKI members for this issue.

Finally, I like to attend you all on the upcoming BNAIC deadline for the submission of papers and demos: please send in your best work to the BNAIC and let's make it a highly interesting event at an interesting location again!

Aristarchus' Visit to Euclid

Henk Visser
Haarlem

SERVANT. Master, there is a mathematician outside who wants to speak to you.

EUCLID. Please, let him or her come in!

ARISTARCHUS (*entering Euclid's room*). Good afternoon, my name is Aristarchus, I live in Athens, but I came to Alexandria in order to read your papers on geometry. I just went through part one of your *Elements*, but I have so many questions about it that I venture to visit you. Am I welcome?

EUCLID (*shaking hands with Aristarchus*). That's a surprise! I have always wished to see you since I read your writings. We have several of them in our library. But you are not going to tell me that you had difficulties following my proofs, are you?

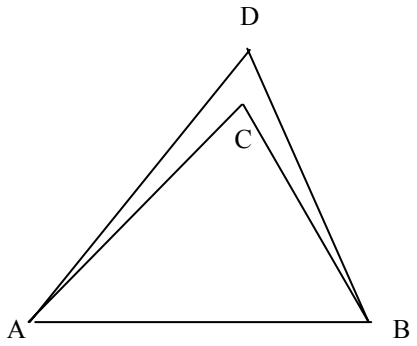
ARISTARCHUS. No, that is not my problem; my questions are deeper, so to say.

EUCLID. Oh, that's why you are called a philosopher! But enough compliments, let us get to work! Tell me what bothers you.

ARISTARCHUS. Well, when I reached your propositions 20 and 21 – do you know which I mean?

EUCLID. Of course! I even ask my students to learn the numbers of the propositions by heart…

ARISTARCHUS. I learned them too, if only in order to memorize the order in which they are proved. I know, for example that proposition 21 says that (*Aristarchus speaks as if he is teaching*) **if on one of the sides of a triangle, from its extremities, there are constructed two straight lines meeting within the triangle, the straight lines so constructed will be less than the remaining two sides of the triangle, but will contain a greater angle.** (*Aristarchus draws the following figure in Euclid's sandbox*):

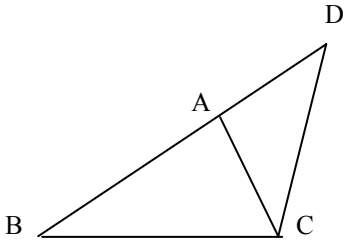


And this brings me to the following questions: why can this proposition only be proved after proposition 20 and why is proposition 20 itself proved as late as it is? Is it not easy to see that (*emphatically*) **in any triangle two sides taken together are greater than the remaining one**? One can even imagine that a philosopher, though not myself, would think that it is such a fundamental insight that it could be regarded as an axiom…

EUCLID. It is true that it is a central proposition, as it imposes a restriction on the forming of triangles, to mention only one consequence. But believe me or not, just because I hate those philosophers who believe that some propositions are self-evident, whatever that may mean, or can be perceived by intuition, whatever that may mean, I deliberately decided to make them ridiculous by designing a system in which the proposition that (*with emphasis*) **in any triangle two sides taken together are greater than the remaining one** comes only after a long chain of reasoning. In fact, I started my research by asking what is really needed in order to prove this theorem!

ARISTARCHUS. That is remarkable, because our Athenian philosophers believe that you actually started with some self-evident principles, and then proceeded to prove a series of theorems one after another. But it is the other way around: your starting point was formed by well-known and useful theorems, and your attempts to prove them provided you with sub-theorems and, eventually, postulates. Am I right?

EUCLID. Quite so! One of my favourite examples is my proof of Pythagoras' theorem. This proof suggested the method with which I dealt with areas of triangles and quadrangles. But maybe we can talk about this another time and concentrate on part one. It is true that the "triangle inequality", as I call proposition 20, has a high status, similar to Pythagoras' theorem. That's why I built the first part of my Geometry around the triangle inequality theorem. Let me explain (*while he draws the following figure in the sandbox*):



ARISTARCHUS. I see, you wanted to prove that the two sides AB and AC of triangle ABC taken together, are greater than the other side BC, but since you can only compare single lines, you took a point on the prolongation of BA such that AD is equal to AC, and you had to prove that BD is longer than BC.

EUCLID. Excellent! And that is why I needed a theorem that makes such a construction possible. But notice that I already drew a triangle, and moreover, prolonged one of its sides. I ensured that this is possible by my first two postulates:

> Postulate 1.
> To draw a straight line from any point to any point.
>
> Postulate 2.
> To produce a finite straight line continuously in a straight line.

Furthermore, in order to determine the point D, I needed the theorems that you know as proposition 2 and proposition 3, and I managed to prove them with only one preceding theorem, proposition 1. I shall mention them for regularity's sake.

> Proposition 1.
> To construct an equilateral triangle on a given finite straight line.
>
> Proposition 2.
> To place a straight line equal to a given straight line with one end at a given point.
>
> Proposition 3.
> To cut off from the greater of two given unequal straight lines a straight line equal to the lesser one.

We can discuss the corresponding proofs later, as you wish, but at least it must be clear to you that I had to justify the possibility of drawing auxiliary lines and circles. Therefore I adopted

> Postulate 3.
> To describe a circle with any center and radius.

ARISTARCHUS. This is all clear to me, and I immediately infer that your desired proof of proposition 20 must make use of the theorem of the isosceles triangle, applied to the triangle CDA in your figure.

EUCLID. Quite right, and this brought me to the next two theorems of my system. You know them:

> Proposition 4.
> If two triangles have two sides equal to two sides respectively, and have the angles contained by the equal straight lines equal, then they also have the base equal to the base, the triangle equals the triangle, and the remaining angles equal the remaining angles respectively, namely those opposite the equal sides.
>
> Proposition 5.
> In isosceles triangles the angles at the base equal one another, and, if the equal straight lines are produced further, then the angles under the base equal one another.

ARISTARCHUS. I even know your proofs of these theorems, and I already begin to understand that these theorems and not proposition 20 appear in the beginning of your system. But now I am anxious to hear how your attempts to find a proof of proposition 20 itself resulted into the intermediate theorems. Were they all necessary for the solution of this problem?

EUCLID. No, they were not. Afterwards I inserted some theorems that are simple consequences of directly preceding theorems. But let us return to the figure for proposition 20. You already remarked that I had to prove that BD is longer than BC. It is important that these lines can be seen as sides of the triangle BCD, because we can now compare the angles of this triangle that lie opposite the sides BD and BC, namely the angles BCD and BDC.

ARISTARCHUS. Aha, the angle BCD consists of two parts, and one of them, the angle ACD is equal to the angle ADC of the isosceles triangle CDA, or what amounts to the same, the angle BDC of the triangle BCD. So we must conclude that the angle BCD is greater than the angle CBD. Now it suffices to prove that in any triangle the side opposite the greater angle is greater.

EUCLID. Stop, you are right, but your earlier conclusion that the angle BDC is greater than the angle CBD requires as much a justification as your conclusion about the equality of the angles ACD and ADC, for which you implicitly appealed to proposition 5 about isosceles triangles.

ARISTARCHUS. But the angle BDC consists of two parts, so it is greater than each of it parts, and therefore it is also greater than something that is equal to such a part.

EUCLID. Quite right. But we must explicitly mention this in our proof, just as we must refer to proposition 5 in order to justify that the two angles are equal.

ARISTARCHUS. But proposition 5 mentions a property of triangles, whereas the properties of wholes and parts and the properties of equalities are not so specific.

EUCLID. That is why I included them in my system under the head of “common notions”; you must have seen all nine, but I remind you of the first and the last one:

> Common notion 1.
> Things which equal the same thing also equal one another.
>
> Common notion 9.
> The whole is greater than the part.

Athenian philosophers would perhaps say that such principles speak for themselves, in other words are self-evident, but this opinion results only from the fact that principles like these are so often used in everyday reasoning, that everyone takes them for granted. Some of my students even wondered why I mention nine common notions, because they believed that some of them need not be mentioned at all, and that five will suffice. But I think that one cannot be cautious enough to make one’s assumptions as explicit as possible.

ARISTARCHUS. This is an extremely important remark. Do you mean that your common notions are not obvious?

EUCLID. Indeed they are not. I found them when I looked for proofs, such as that of the triangle inequality theorem, so they were not beforehand clear to me. The nine common notions that are part of my system concern geometrical things such as points, lines, angles, and other figures, and also areas and volumes, that is to say, in so far the mentioned properties are applicable to them.

ARISTARCHUS. Does this mean that your common notion 9 does not hold for points?

EUCLID. That is correct. And the conclusion must be, *pace* your Athenian colleagues, that the common notions are just postulates which can be used in geometrical proofs. Nothing has been said about other applications. Moreover the fact that they might be used in everyday reasoning about other things than geometrical objects is not a valid argument for regarding them as evident principles. But I have already said too much about your colleagues, for I don't give a cent for their idle talk. Let us once more return to the proof of proposition 20. You were right to notice that it is sufficient for our purpose to prove that in any triangle the side opposite the greater angle is greater. However this is easier said than done, as you may have inferred from the procedure in my book. I did not find a direct proof of the preceding proposition 19 that indeed says that in any triangle the side opposite the greater angle is greater.

ARISTARCHUS. I know, and I wondered why you gave an indirect proof of proposition 19. As far as I can see, it is merely a logical consequence of proposition 5 and proposition 18 that says that in any triangle the angle opposite the greater side is greater. You simply assumed that in your figure the side opposite the greater angle is not greater, and it appeared that this is excluded by proposition 5 and proposition 18 together. What I miss is a direct insight into the content of proposition 19.

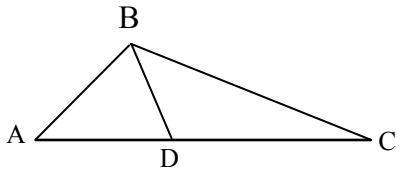
EUCLID. Well, to ask for direct insight is asking too much. Given the way in which I proved this theorem, we do not even have a direct insight into the content of proposition 2. You may have heard of the misgivings of some of my colleagues about my proof.

ARISTARCHUS. Yes, but that is not my problem. I admire your proof of proposition 2. It is purely geometrical, and what else do we want? Perhaps I incorrectly used the philosophical terminology of my Athenian colleagues when I asked for a direct insight. What I meant was that your indirect proof of proposition 19 establishes no geometrical connection between the size of an angle and the opposite side of a triangle. You made as it were a logical detour in order to gain the desired result and this gives me a certain feeling of discomfort.

EUCLID. I share your opinion, but unfortunately I saw no other way of building my system. Besides I rather easily found a proof of proposition 18 that establishes a connection between the size of a side and the opposite angle of a triangle, in this order. That is to say, it is true that I still needed some intermediate theorems, but eventually everything came down to the propositions 4 and 5, if I leave the propositions 1 and 3 out of consideration. As you know, these theorems are required for the auxiliary lines in the figures. Did you notice how strong the propositions 4 and 5 are when you studied part one?

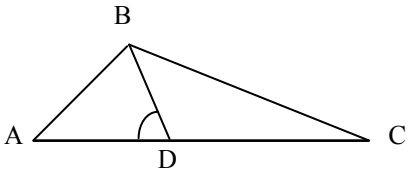
ARISTARCHUS. I did, but nevertheless I would like to know how you discovered that the curious proposition 16 helps to prove proposition 18, and what is more, how you found your amazing proof of proposition 16. You see that I already memorized the number of this important theorem that says, let me see (*with emphasis)*: **In any triangle, if one of the sides is produced, then the exterior angle is greater than either of the interior and opposite angles.**

EUCLID. You are asking two questions. In order to answer them, I will continue my explanation by analysing proposition 18 (*draws the following figure*).



ARISTARCHUS. I see, you already made use of the assumption that AC is greater than AB, by determining the point D on AC such that AD is equal to AB. Now you wanted to prove that the angle ABC of triangle ABC is greater than the angle ACB. Fortunately the angle ABC is a whole consisting of two parts, so you decided to prove that the angle ABD is at least as great as the angle ACB. The angle CBD is not considered for such an equation, because it is easily seen that this angle can be greater than the angle ACB. This is already the case in your figure. But ABD is an isosceles triangle, and it follows that the angle ABD is equal to the angle ADB. This means that your task came down to proving that the angle ADB is at least as great as the angle ACB. But how did you find out that there must be a theorem such as proposition 16?

EUCLID. The idea came to me when I looked at the triangle DCB and suddenly saw that the angle ADB, which I regarded as one of the interior angles of the triangle ABD, can also be seen as an exterior angle of the triangle BDC (*Euclid draws a small arc in his last figure*).



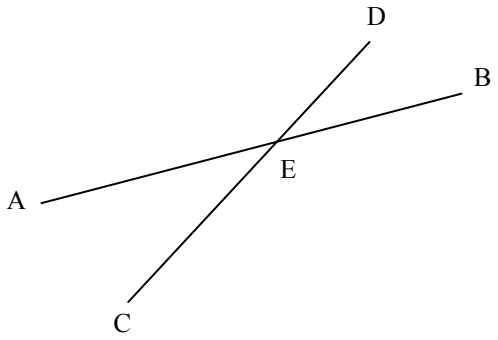
ARISTARCHUS. That is interesting. The angle that you marked just now was described by you in two ways, and each of them corresponded with a particular way of seeing. These two perspectives cannot be taken simultaneously; it requires a changeover to pass from the one to the other. Did you really have such a sensation?

EUCLID. Yes, and you and I can repeat it by first focussing on the left side of the figure, and then on its right side. But what is also important, I intuitively inferred in the second case that the exterior angle ADB of the triangle BDC is greater than its interior angle DCB and I almost simultaneously drew the promising conclusion that this is a general property of triangles. In other words, in any triangle, if one of the sides is produced, then the exterior angle is greater than either of the remote interior angles. There you are.

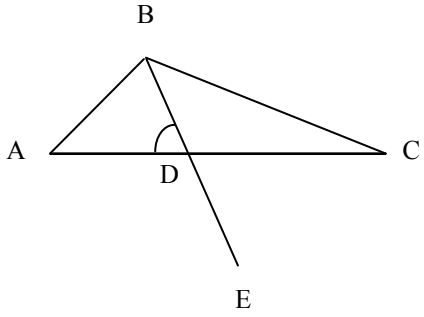
ARISTARCHUS. But I thought that you did not believe in intuition. You reproached my Athenian colleagues that they appeal to intuition, and now you confess that you drew intuitive inferences yourself. What is this?

EUCLID. The difference is that they believe that intuition can give us knowledge, whereas I see it only as a spontaneous discovery of something conspicuous during the search for a solution of a problem. Such intuitive inferences remain sometimes isolated in the sense that they do not contribute to a solution, but it also happens that they are followed by a promising conclusion that points to a certain direction and stimulates you to do further work on your problem. This was the case when I tried to prove proposition 18, and I immediately set myself to find out what would be required to establish the theorem of the exterior angle.

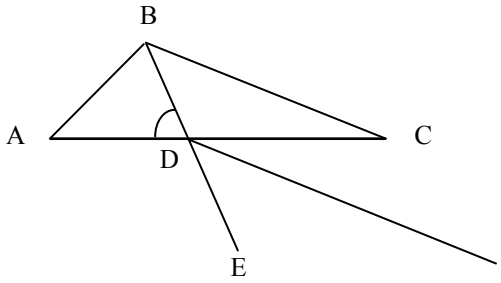
ARISTARCHUS. That is indeed completely different from the Athenian view of intuition. Your promising conclusion stood only at the beginning of a presumably long process of finding intermediate theorems. I do not think that my Athenian colleagues could have done what you did, bringing your task to a good end, without new postulates. Please tell me now how you filled up the gap between proposition 16 and proposition 5. How did you deal with the extremely important intermediate theorem 15, which says that two intersecting straight lines make the opposite angles equal to one another? It looks so simple when we look at the figure, but apparently this is an illusion. Back home I shall try to convince my colleagues that they are wrong to believe in intuition as they do. I hope that this example will convince them. (A*ristarchus draws the following figure in the sand*)



EUCLID. This is indeed a fine example. Your colleagues may call it evident that the angles AEC and BED are equal, but if they do this, then they have not understood one jot of my approach. But let me now tell you how I proceeded with proposition 16. After that, I will comment on proposition 15. I will make use of the figure for proposition 18, but produce the line BD further to get the line BE (*does this with the following result*):

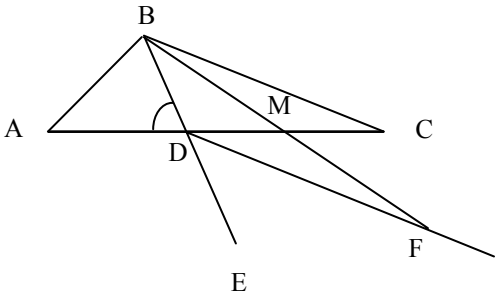


The problem was that I wanted to prove that the exterior angle ADB of the triangle BDC is greater than its interior angle BCD, but this effort failed, whereas it succeeded with the exterior angle ADE. Look, if this angle is indeed greater than the angle ACB, then it must contain as a part an angle that is at least as great as the angle ACB. Now I imagined that it would contain an angle that is equal to the angle ACB (*draws one more line in the figure*):

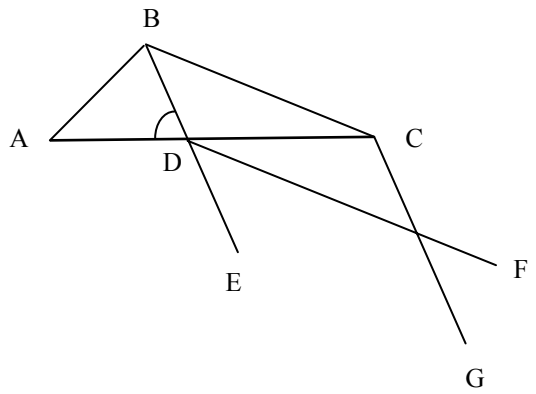


But how do we get a point F on this new line such that the angle FDC is equal to the angle BCD?

ARISTARCHUS. I know the answer, because I already saw your proof, but I presume that you argued that equal angles must come from an application of proposition 4. Therefore you looked for two triangles that not only have two sides equal to two sides respectively, but also have the angles contained by the equal straight lines equal. I am impressed that you got these triangles by first determining the middle M of the line CD, and then producing BM further to get a point F such that MF is equal to MB. (*Aristarchus draws a new figure*).



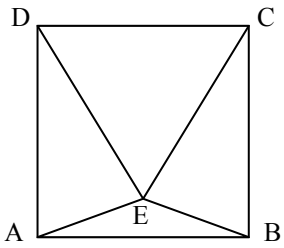
EUCLID. Your answer does indeed describe the way in which I found the proof, but I must confess that I got the idea of the point M in the middle of the line DC only after I considered that the required point F forms a parallelogram with the points C, B and D (*draws the line CG parallel with the line BE in his original figure and adds the letter F*):



ARISTARCHUS. That is remarkable. But is it not strange that you use a result from a later part of your system in an earlier part?

EUCLID. It is true that I have no theorems about parallelograms in this part of my geometrical system, but I have no objections against the use of knowledge of later parts in order to find a proof in an earlier part, as long as it does not affect the proof itself. And it follows from your summary of the proof of proposition 16, that this is not the case here.

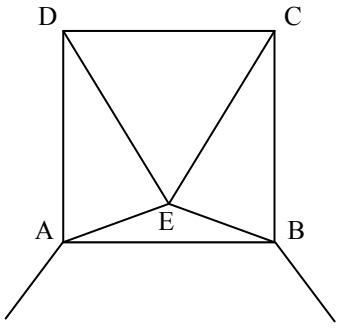
ARISTARCHUS. I agree. It reminds me of a proof that I once found for the following interesting problem (*draws the next figure*):



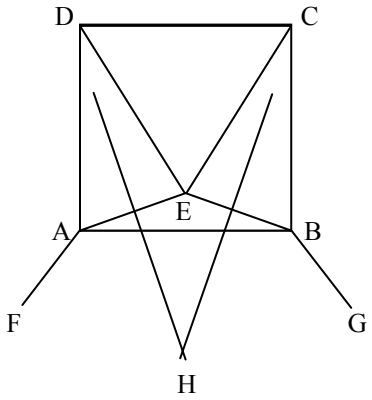
Suppose that the angles EAB and EBA are one sixth of a right angle. Prove that the triangle CDE is equilateral.

EUCLID. I know this problem, and my solution begins with the construction of a point F within the square such that the angles FBC an FCB are also one sixth of a right angle. But what is your solution?

ARISTARCHUS. Let me first tell you how I discovered my solution. Looking at the triangle AEB, I suddenly saw it as a chord triangle of an equilateral and equiangular twelve-angled figure. Look (*adds some lines to his figure*):



EUCLID. I see. Then you constructed the center H of the circumscribed circle by bisecting the lines AE and BE and the rest is easy (*draws some more lines in Aristarchus' figure*).



ARISTARCHUS. Yes, but I did not call H the center of this circle. Moreover I did not draw the line AF and BG in my proof. My students understood it, even though they had never heard of equilateral and equiangular twelve-angled figures.

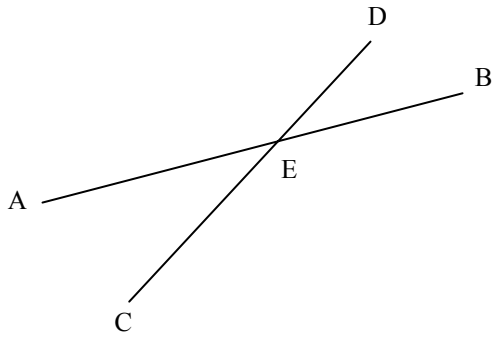
EUCLID. That is fine. Yet it remains interesting that you and I saw things in our figures that are not there, so to say. But the resulting intuitive inferences did excellent work!

ARISTARCHUS. That is to say, their promising conclusions came true!

EUCLID. I think that we must distinguish between the way in which a solution is discovered and the solution itself. In my systematic approach there are high demands upon the proofs, but I kept the history of my discoveries hidden.

ARISTARCHUS. That is one of the reasons that I came to see you, and I am already much wiser. I understand your combined proof of proposition 16 and proposition 17 but I conclude once more how important proposition 15 is for this combined proof, for you used it twice, first in order to reach the conclusion that the angles BMC and FMD are equal, and second in order to argue that the angle ABD is equal to the angle CDE. This makes me the more curious about your derivation of proposition 15. I saw that you needed a relatively large number of intermediate propositions, namely proposition 13, proposition 11, proposition 8 and proposition 7.

EUCLID. Good question. Let us look again at your figure for proposition 15:



My problem was that I found it difficult to regard the figures AEB and CED as angles. To me they look more as flattened triangles. But if I would call them angles, then this would be of no help, for then they could not be angles of triangles. This means that proposition 4 is anyhow not applicable to them. Perhaps do you now understand why I defined angles as I did?

ARISTARCHUS. You mean:

> Definition 8.
> A plane angle is the inclination to one another of two lines in a plane which meet one another and do not lie in a straight line.

EUCLID. Quite right. But after a long period of thinking about it, I saw that a proof of proposition 15 would not cause difficulties anymore, as soon as I could prove that the two angles AED and BED are together equal to two right angles.

ARISTARCHUS. Now I also begin to understand your

> Definition 10.
> When a straight line standing on a straight line makes the adjacent angles equal to one another, each of the equal angles is right, and the straight line standing on the other is called a perpendicular to that on which it stands.

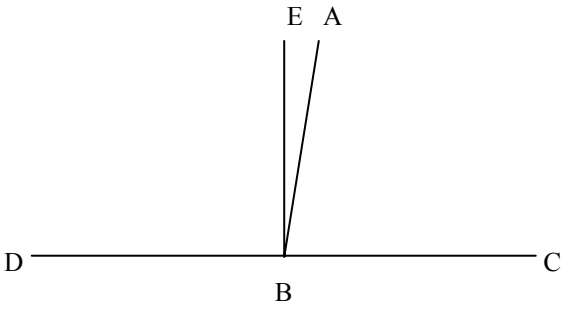
For this brought you to your

> Proposition 13.
> If a straight line stands on a straight line, then it makes either two right angles or angles whose sum equals two right angles.

EUCLID. That is correct. But do not forget

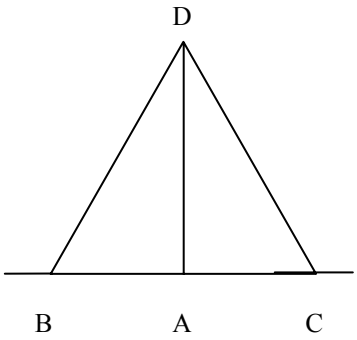
> Postulate 4.
> That all right angles equal one another.

ARISTARCHUS. I see. And the proof of proposition 13 requires that it must be possible to draw a straight line at right angles to a given straight line from a given point on it. (*Aristarchus draws the following figure*.)



If the angle *CBA* equals the angle *ABD*, then they are two right angles, according to definition 10. But if not, then we draw *BE* from the point *B* at right angles to *CD*. This is the crucial step, for now the angles *CBE* and *EBD* are two right angles. The rest is easy with the help of your common notions.

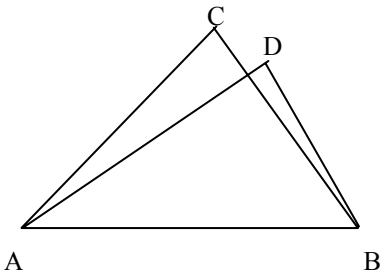
EUCLID. Yes, and the possibility of the construction of the line BE is explained in proposition 11. The construction itself was simple, for I had the propositions 1 and 3 at my disposal. (*Euclid draws the following figure.*)



The only thing that gave me the greatest troubles was the proof of the theorem that guarantees that the triangles ABD and ACD, which have their three sides equal, have also their angles equal. I mean:

> Proposition 8.
> If two triangles have the two sides equal to two sides respectively, and also have the base equal to the base, then they also have the angles equal, which are contained by the equal straight lines.

ARISTARCHUS. I have seen that your proof was a simple application of the preceding theorem. I know what it amounts to, namely that the construction of a triangle with two sides equal sides respectively on the same base is unequivocal (*Aristarchus draws a new figure*).



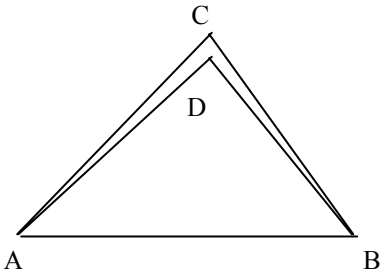
But your formulation of proposition 7 is so complicated that I could not memorize it literally. It states, in my words, that given a certain triangle with certain sides, it is impossible to construct another triangle at the same side on the same base and with two equal sides respectively in the same position. This means, in my figure, that if the lines AC and AD are equal, and if the same holds for the lines BC and BD, that then the points C and D coincide.

EUCLID. I have no problems with your description. Can you also prove this theorem with the help of proposition 5? When I found it, my original task of inventing a system in which the triangular inequality theorem can be proved, was accomplished. This makes that proposition 7 is, in a sense, my favourite theorem, though it is only used in the proof of proposition 8 and nowhere else. Moreover, I have a special feeling about my proof. It is a simple, but not a perspicuous proof, and I can use this fact as a weapon against philosophers who still think that proofs must give a clear reason why the theorem holds. Your criticism, that the formulation of this theorem is already intricate, is right. It is also peculiar that the conclusion is negative, for it is said about a certain construction that it cannot be executed. Now I ask you: can you imagine an impossible situation, ahem…? But the theorem could be proved, so there is an explanation for it and the explanation can be followed step by step. Yet I think that philosophers will still have misgivings about it, because they miss direct insight into both the content of the proposition and the proof of the proposition. And this is in sharp contrast with the direct insight that they contend to have into the theorem that appears in my system as late as proposition 20, the triangular inequality theorem.

ARISTARCHUS. I am flabbergasted. I hope that I can reproduce your proof of proposition 7 back in Athens, so that I can have a meaty discussion with my colleagues. If you allow me, I shall give your proof here and now, so that you can correct me if I go wrong.

EUCLID. Please, go ahead. I will try to react as if I am an Athenian philosopher, though I am not sure that I understand them well.

ARISTARCHUS. I am not afraid that your comments will be out of place, given your smartness. But I can not make myself answerable for my colleagues. But let me start. Suppose that C and D are different, as my figure already shows. I'm going to derive something that is logically impossible. As you know, this is not the end of the matter, because in my figure the point D lies outside the triangle ABC, and therefore I must give a similar reasoning for the case that D lies inside the triangle ABC. (*Aristarchus draws another figure*.)



EUCLID. Are you sure that there are no other cases to consider?

ARISTARCHUS. Well, D lies outside or inside the triangle or else it coincides with C for it cannot lie elsewhere on the lines AC and BC. In the last case, there is nothing to prove any more.

EUCLID. I agree. But suppose now that D lies outside the triangle ABC. You said that you would derive a contradiction. But this implies that your figures show impossible situations. How is that possible?

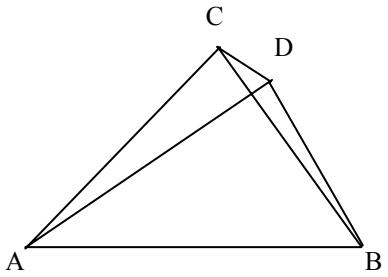
ARISTARCHUS. I did not make the lines AC and AD and the lines BC and BD equal by performing a construction. I just assumed that D lies outside the triangle ABC, and then postulate 1 implies that there is a line CD, whereas all its points except C lie also outside the triangle ABC. This can be concluded without taking the special properties of the drawn figure into account. The figure does not show an impossible situation, because it does not take the equality of the lines into account.

EUCLID. This means that the figure is incorrect. How can you be so sure that this fact does not influence your reasoning?

ARISTARCHUS. Because I support each step by a reference to a definition, a postulate, a common notion, or an already proved proposition.

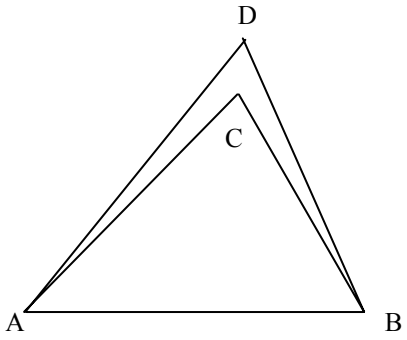
EUCLID. OK. Go on.

ARISTARCHUS. Look at my first figure. I told you that there is a line CD, so let me draw this line (*Aristarchus connects the points C and D in his first figure.*)



It follows that the triangles ACD and BCD are isosceles triangles, so we can apply proposition 5. In particular, the angle ADC is equal to the angle ACD. Therefore, the angle ADC is greater than the angle DCB that is a part of the angle ACD. It follows that the angle BDC, which contains the angle ADC as a part, is much greater than the angle DCB. But according to proposition 5 the angle BDC is equal to the angle DCB. Now it is demonstrated that it is both much greater and equal and that is impossible. Consequently C and D coincide.

EUCLID. I noticed that you did not explicitly mention the common notions that you used in your proof. I assume that this is in order, but in my opinion you leaned rather heavily on your figure. Are you sure that your reasoning would have been the same if you had drawn another figure? (*Euclid draws a third figure*.)

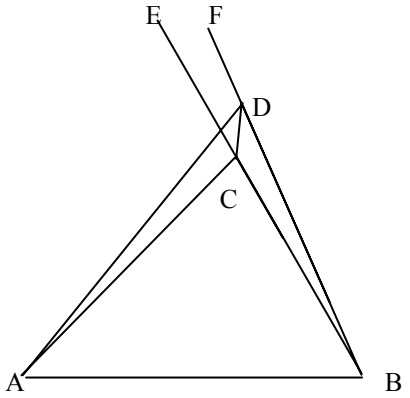


ARISTARCHUS. Good heavens! My reasoning does not apply to this figure. (*He pauses a moment.*) Oh, but this is nothing else than the second case, for now the vertex of one of the triangles lies inside the other triangle!

EUCLID. (*laughing*) I am glad that you saw it. Now I am not talking anymore as an Athenian philosopher, but I think that it is good that I made my last remark. Otherwise you could fall into a trap, as soon as you had to admit that your proof depended in some way or another on your figure.

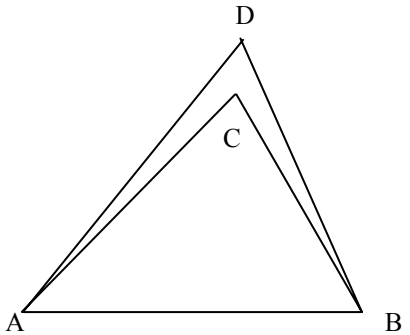
ARISTARCHUS. I will now try to reproduce your proof of the second case. But tell me first, how you found is, because it requires more ingenuity than the proof of the first case.

EUCLID. I must admit that I found my proof more or less by luck. I remember the moment that I connected not only the points C and D, but also produced BC and BD, and the joy it gave, for it completed my task.



ARISTARCHUS. I missed this part of your proof when I read book one, but I see how it goes, thanks to your auxiliary lines, of course. The angle ECD is smaller than the angle ADC, because it is a part of the angle ACD, and it is much smaller than the angle CDF, because this angle contains the angle ACD as a part. But the angles ECD and CDF are equal according to the second part of proposition 5. Very nice!

EUCLID (*erases the lines CD, CE and DF in his last figure, so that the preceding one reappears*).



Don't you notice anything?

ARISTARCHUS. This is the same figure as I began with! If we had had proposition 21 already at our disposal in this stage of your system, then everything would have been easy. But I learned from you that we are not philosophers who mix up everything, but proceed systematically. Thank you very much. I can now safely return to Athens.

EUCLID. Ho, ho, Aristarchus. I have been told that you also did interesting new work in mathematics yourself. I am anxious to hear more about it.

ARISTARCHUS. With pleasure, but can you first offer me a drink, for I have become pretty thirsty after your lecture.

EUCLID. I am glad that you bring this up, for I always forget to take care of my condition when I am working. (*Euclid calls his servant.*)

Plan-Repair in Single-Agent and Multi-Agent Systems

Ph.D. thesis by Roman van der Krogt

Mathijs de Weerdt
Delft University of Technology

On December 21, 2005, Roman successfully defended his thesis on plan-repair in both single and multi-agent systems. I not only read his thesis and attended this defense, but I also was a friend and his roommate at the Delft University of Technology during his research as a Ph.D. student. Please forgive me if the following report on his thesis is consequently a bit biased.

"No plan of operations extends with any degree of certainty beyond the first encounter with the main enemy force." With this quote from the German general Von Moltke (in the 1870s) Roman illustrates the importance of reconsidering your plans, and begins his thesis.

His research is focused on the following question: how can a plan be adapted to changed circumstances? Military operations are not the only ones that can seldomly be executed the way they are planned. Space operations, logistical plans, and many other situations suffer from similar unexpected events. Roman gives three reasons for trying to repair such plans instead of constructing new plans from scratch. First, it may cost less computation time. Second, it may be easier in this way to invalidate as few commitments to others as

possible, and, last but not least, in mixed-initiative settings where human and computational planners interleave making changes to the plan, small changes are far more acceptable to the human planner. Clearly, the problem of repairing plans, called PLANREC (plan recovery), is well worth investigating. Now I will briefly discuss his main contributions to solving this problem.

His first contribution is an extension of the action-resource formalism such that it can also describe plan-repair problems. Roman proves that his formalization is at least as expressive as the languages that have been used for the last twenty to thirty years to describe plans and planning problems (STRIPS and HTN). This formalization includes a framework to model not only actions and plans, but also unexpected events and failures. He then defines complete operators in this formalism that can transform a plan to any other plan. These operators are the building blocks of strategies for repairing plans.

Next, building upon an existing framework called refinement planning (that can be used to describe any planning algorithm just by varying refinement strategies), he shows how different strategies for repairing plans can be plugged into a framework for refinement replanning. With the introduction of this framework follows, in my opinion, the most interesting result of his work. He shows how existing (ordinary) *planning* heuristics can be used to construct an effective *plan-repair* strategy. This result not only helps him to get good results on plan-repair problems (which he proves pragmatically by testing his implementation POPR on a variety of benchmark problems), but it also enables the extension of any planning tool to a planning and plan-repair tool with a relatively small effort.

His final result broadens the applicability of his ideas to situations where multiple planning agents are involved. As a starting point he assumes that each agent has some (single-agent) plan-repair method at its disposal, and that an auction can be used to coordinate the agents, for example to re-allocate (failed) tasks. He then uses the local plan-repair methods in an algorithm that the agents run distributedly. This method turned out not only to be a way of solving the plan-repair problem in multi-agent systems, but it is also an original approach to create multi-agent plans from scratch.

Both the single-agent plan-repair algorithm and the multi-agent plan algorithm are analyzed empirically using a plan-repair benchmark set based on those used for the bi-annual AI planning competition. These benchmark problems are included in an appendix to his thesis.

To conclude, his thesis is a thorough piece of work, ranging from the extension of a theoretical framework for plan-repair to the implementation and testing of methods both for single-agent and multi-agent plan-repair. Anyone interested in plan-repair methods should definitely read this thesis, or at least a couple of his other publications.

Symposium ToKeN in Full Swing

Christiane Klöditz
NWO

This year's ToKeN[1] symposium was organised on March 31, 2006 in the Kamerlingh Onnes building of Leiden Faculty of Law. This is one of the sites where ToKeN research is carried out.

Kamerlingh Onnes Building.

There are twenty ToKeN projects ongoing; all of them were presented at the symposium. With the title *ToKeN in Full Swing* the Programme Committee was pleased to announce that the NWO ToKeN programme is proceeding very well.

[1] ToKeN − Accessibility and Knowledge Extraction in the Netherlands − is a multidisciplinary NWO research programme involving specialists in both cognitive and computer science as well as three fields of application, namely Healthcare, Education & Culture and Law Enforcement & the Judicial System. The programme focuses on the ability of individuals to retrieve relevant knowledge and information from computer systems and to derive implicit knowledge from raw data. The overall aim is to develop methods and techniques to optimise the interaction between human users and advanced multimedia information systems.

The day was opened by *Professor Wim Voermans*, director of the E.M. Meijers Institute for Legal Studies, a research institute of Leiden Faculty of Law. He welcomed the participants in the faculty building, illustrating its remarkable history.

In his sweeping keynote lecture "*AI and Law Approaches to Modelling Legal Reasoning*" Professor Trevor Bench-Capon of the University of Liverpool gave insight in the topic of modelling legal reasoning and in the ways it has been approached in Artificial Intelligence and Law. According to Bench-Capon modelling legal reasoning as argumentation is currently a topic exciting much research interest. The slides of this lecture will be published on the ToKeN-website www.nwo.nl/token in due time.

Professor Trevor Bench-Capon.

The following six plenary talks gave insight in the ongoing ToKeN research.

Dr. Michel Klein (Artificial Intelligence Department, Vrije Universiteit Amsterdam) presented the research carried out in the BEST project − *BATNA Establishment using Semantic Web Technology*. The aim of this project is to support laymen in judging their legal position in a liability case.

In his talk on the DUMPERS project − *Distributed User Modeling and Exploration in Personalized Recommender Systems* − Dr. Maarten van Someren (Human-Computer Studies Laboratory, University of Amsterdam) demonstrated experimental results of a menu-optimization method that actively tries to minimize the time users need to find their target information.

Dr. Maarten van Someren.

According to the tradition of ToKeN-events, lunch was cheered up by a lunch concert, this year with Ms. Naomi Tamura on the piano.

During the poster session after the lunch break the 75 participants took the chance to engage themselves in the presented ToKeN-projects. The more than twenty posters were presented enthusiastically and discussed thoroughly. The ToKeN Best Poster Award 2006, nominated by the participants went to the poster entitled *Infering User Interest for a Virtual Museum Guide* by L. van Maanen, C. Janssen, H. van Rijn of the I2RP project − Intelligent Information Retrieval and Presentation in Public Historical Multimedia Databases.

The afternoon session started with the so-called *Users Corner* and continued with plenary talks.

In the Users Corner the chair of the ToKeN Users Committee (UC) Dr. Hans van Eekelen pointed out the tasks and activities of this committee and its findings so far. The latter were mainly based on the diverse site visits carried out by the members of the committee during the last twelve months. Two of the members of the UC, namely Vincent de Keijzer (Gemeentemuseum Den Haag) and Mr. Gerben Wierda (Council for the Judiciary) added a few remarks from a user's point of view.

Following, Ir. Stefano Bocconi (Centrum voor Wiskunde en Informatica, Semantic Media Interfaces Group) presented the results of his Ph.D. research carried out within the I2RP project. Scope of the thesis is presenting video material retrieved on the basis of a user-supplied query.

In her lecture drs. Loes Braun (Institute for Knowledge and Agent Technology, Universiteit Maastricht) who is working on the MIA project − Medical Information Agent − discussed to which

extent software agents can be used to support physicians in their information-retrieval process. The goal is to provide physicians with relevant literature without spending extra time and without acquiring specific skills. For this lecture Loes Braun received the ToKeN Best Oral Presentation Award 2006.

Drs. Loes Braun.

Dr. Wojtek Zajdel (Informatics Institute, University of Amsterdam) and Drs. Dirkjan Krijnders (Artificial Intelligence, University of Groningen) illustrated the first outcomes of the CASSANDRA project − Context-Aware SenSing for AgressioN Detection and Risk Assessment. Aim of this project is to develop an advanced surveillance system for human-activity recognition in dynamic environments combining audio- and video-processing.

Jan-Maarten Luursema (University of Twente, Faculty of Social and Behavioural Sciences) presented his work on virtual learning environments holding great promise as a tool for medical education. This research is part of the DIME project − Digital Interactive Medical Exploratorium − in which three university partners and one local hospital cooperate on creating and implementing visualizations of vascular pathology and vascular fluid flow in a virtual learning environment.

In his concluding remarks the chairperson Professor Aernout Schmidt (Leiden University, Faculty of Law and member of the ToKeN Programme Committee) summarized the day. Finally the chair of the ToKeN Programme Committee Professor Jaap van den Herik took the opportunity to thank the keynote speaker, the ToKeN speakers, all participants and those involved in the organisation of this day for yet another interesting and inspiring ToKeN symposium.

Token of Honour

Jaap van den Herik
MICC-IKAT, Maastricht

The title doctor is the highest title in the Netherlands that can be achieved by performance. Indeed, the writing of a thesis is quite a performance and the BNVKI Newsletter regards the efforts needed to arrive at the title in a proper way. We include the candidates in the announcement of the Ph.D. thesis defences and repeat this list at the end of the year. Moreover, every doctor is allowed to have this title in front of his/her name.

A few persons like the performance and reiterate the efforts by doing a second Ph.D. defence. An instance of such perseverance is Dr.Dr. Alex de Voogt (Leiden University). In the U.S.A. such an effort is rewarded by the double title Drs. So, it is a good thing that our titles are currently replaced by Ba and Ma titles. In a few years no confusion is possible anymore.

However, here we are talking on titles that fulfil a role in daily life. In the Netherlands we are not used to the American standards and mores, so it was a surprise to all of us that professor Siklóssy, when stepping down as NVKI chairman (in Kerkrade 1990), suggested that we should include in the newsletter a roster of Past Presidents as a token of gratitude for the services they had given to the Association. The Dutch denied that idea with a small smile (admittedly, not a big one) and went over to the election of the new President. In many international journals and associations we see that Editors-in-Chief and Past Presidents are honoured for their services.

Being a Dutchman, I must admit that I did not have such strong feelings on this topic. But recently I became aware that history, even recent history, should be documented in a proper way. It should be listed and these lists should be available to all members and in particular to busy members of the board. The usual example among lawyers to keep contact with the society is to be a member of a chess club. But see what happened a month ago to a chess club that celebrated its 70th birthday (yes, it was founded in the heydays of professor Max Euwe). For this event it had decided to award two persons with a honorary membership (in Dutch we may distinguish between “lid van verdienste” (creditable member) and “erelid”). During the celebration the two members were called forward and were distinguished with the awards. One person (erelid) was 91 years old and was extremely happy. The other one was in the beginning of his sixties and had

done many things for the club over a long, very long period of time. He was not so happy with his distinction, not that he had hoped for an "erelidmaatschap", but he could not imagine that all the members present there had forgotten that ten years ago (1996) he was so pleased with the reception of his title "lid van verdienste".

The board members were disappointed on their faults, they were fervent readers of their own club magazine and had clearly missed that news. They wondered why it was not repeated in every issue. An honorary member is an honorary member from the time he/she is elected and awarded. In France and in the U.S. the Past President is during the remainder of his/her life addressed as Mister/Mrs President; for Emeritus Professors, the same procedure holds; they remain addressed their whole further life as "Professor".

If a candidate passes his/her Ph.D. defence with success he/she is awarded with the long-life title Dr. We should think on what to do with the other titles. If a Past President of the (B)NVKI becomes a President again, there is nothing to worry about. However, if the only honorary member of the BNVKI will be called forward on the celebration of 25 years of (B)NVKI, which will happen soon (the birth was in 1981), to be awarded as a honorary member, I may imagine that the honorary member will not be happy. Forgotten during active life time is the worst thing what can happen to a person. This is not a claim to do away with the doctor's title or to fill the pages of this newsletter with the names of the Past Presidents, but it is an encouragement to pay more attention to history.

Meanwhile we reproduce the titles of the Ph.D. theses that successfully passed the review of the various assessment committees. All Ph.D. students are wholeheartedly congratulated with reaching this milestone. In our aim at perfection we mention the Ph.D. defence by Ania Wojdel (December 2005) too, since it had missed our list of announcements.

Ania Wojdel (December 21, 2005). *Knowledge Driven Facial Modelling*. Delft University of Technology. Promotor: Prof.dr. H. Koppelaar. Toegevoegd promotor: Drs.dr. L.J.M. Rothkrantz.

M. Kyas (April 4, 2006). *Verifying OCL Specifications of UML Models*. Universiteit Leiden. Promotores: Prof.dr. J.N. Kok and Prof.dr. W.-P. de Roever.

Eelco Herder (April 13, 2006). *Forward, Back and Home Again: Analyzing User Behavior on the Web.* Universiteit Twente. Promotor: Prof.dr.ir. A. Nijholt. Assistant-promotor: Dr. E.M.A.G. van Dijk.

Noor Christoph (April 21, 2006). *The Role of Metacognitive Skills in Learning to Solve Problems*. Universiteit van Amsterdam. Promotor: Prof.dr. B.J. Wielinga. Co-promotor: Dr. J. Sandberg.

Marko Smiljanic (April 21, 2006). *XML Schema Matching – Balancing Efficiency and Effectiveness by Means of Clustering.* Universiteit Twente. Promotor: Prof.dr. W. Jonker. Co-promotor: Dr. M. van Keulen.

Marta Sabou (April 27, 2006). *Building Web Service Ontologies.* Vrije Universiteit Amsterdam. Promotores: Prof.dr. F.A.H. van Harmelen and Prof.dr. H. Stuckenschmidt.

Hans Mulder (April 27, 2006). *Rapid Enterprise Design.* Delft University of Technology. Promotor: Prof.dr.ir. J.L.G. Dietz.

Cees Pierik (May 3, 2006). *Validation Techniques for Object-Oriented Proof Outlines*. Universiteit Utrecht. Promotor: Prof.dr. J.-J. Ch. Meyer. Co-promotor: Dr. F.S. de Boer.

H.C. van Assen (May 10, 2006). *3D Active Shape Modeling for Cardiac MR and CT Image Segmentation*. Universiteit Leiden. Promotor: Prof.dr. J.H.C. Reiber.

S.G.R. Nijssen (May 15, 2006). *Mining Structured Data.* Universiteit Leiden. Promotor: Prof.dr. J.N. Kok.

Ziv Baida (May 29, 2006). *Software-aided Service Bundling – Intelligent Methods & Tools for Graphical Service Modeling.* Vrije Universiteit Amsterdam. Promotor: Prof.dr. J.M. Akkermans. Co-promotor: Dr. J. Gordijn.

Ronny Siebes (June 9, 2006). *Semantic Routing in Peer-to-Peer Systems.* Vrije Universiteit Amsterdam. Promotor: Prof.dr. F.A.H. van Harmelen.

Xandra van Montfoort (June 20, 2006). *Gist and its Role in Difference Detection*. Eindhoven University of Technology. Promotores: Prof.dr. D.G. Bouwhuis and Prof.dr. E.O. Postma.

Mohamed Wahdan (June 29, 2006). *Automatic Formulation of the Auditor's Opinion*. Universiteit Maastricht. Promotores: Prof.dr. H.J. van den Herik and Prof.dr. E.H.J. Vaassen. Co-promotores: Prof. H.F. Ali and Dr. P.H.M. Spronck.

Section Editor
Richard Starmans

John-Jules Meyer Honorary Member of SIKS

In its meeting on March 17, 2006 the Board of Governors of SIKS appointed prof.dr. John-Jules Meyer (UU) honorary member of the school. With prof.dr. Reind van de Riet (VU) John-Jules Meyer was one of the founding fathers of SIKS in the mid-nineties, and, more importantly, Meyer became the first scientific director of the School. For more than a decade he held this position as of January 1, 2006, when prof.dr. Roel Wieringa (UT) became the new scientific director of SIKS.

John-Jules Meyer is now the second honorary member, after Van de Riet, who was appointed in 2002 when he left his position of chairman of the Board of Governors.

Currently, Meyer still is heavily involved in SIKS. In the Scientfic Board he is focus-leader for Agent Technology, one of SIKS' leading research interests.

Basic Courses: "System Modeling" and "Knowledge Modeling"

INTRODUCTION

From May 29 till June 2, 2006, the School for Information and Knowledge Systems (SIKS) organizes two basic courses: "System modeling" and "Knowledge modeling". The location will be Landgoed Huize Bergen in Vught. Both courses will be given in English and are part of the Basic Course Program for SIKS-Ph.D. students.

Although these courses are primarily intended for SIKS-Ph.D. students, other participants are not excluded. However, their number of passes will be restricted and depends on the number of SIKS-Ph.D. students taking the course.

SCIENTIFIC DIRECTORS

- dr. Pascal van Eck (UT), dr. Willem-Jan van den Heuvel (UvT) "System modeling";
- dr. Bert Bredeweg (UVA) "Knowledge modelling".

PROGRAM

A provisionary program will be made available in due course.

REGISTRATION

In the conference center there is a limited number of places and there is interest from other groups in the topic as well. Therefore, an early registration is required.

Deadline for registration for SIKS-Ph.D. students: May 09, 2006.
After that date, applications to participate will be honoured in a first-come first-serve manner. Of course, applications to participate from other interested groups are welcome already. They will receive a notification whether they can participate as soon as possible.

Information for non-SIKS-Ph.D. students
SIKS needs a confirmation from your supervisor/ office that they agree with the arrangement and paying conditions.

For registration you are kindly requested to fill in the registration form at the SIKS-site.

SIKS Masterclass on "Requirements Engineering & Information Modelling"

DETAILS

Date: Tuesday May 30, 2006
Time: 10.00 a.m. - 16.30 p.m.
Address: Vrije Universtiteit
De Boelelaan 1105
1081 HV Amsterdam
Room F123 VU
Host: Prof. dr. J.M. Akkermans (VU)

PROVISIONARY PROGRAM:

10.00-10.30 Coffee and registration
10.30-11.45 Talk by John Mylopoulos (U Toronto)
11.45-12.45 Talks by Patrick Dewilde (tbc) and Ziv Baida
12.45-13.45 Lunch
13.45-15.00 Talk by Yves Pigneur (HEC Lausanne)
15.00-15.30 Discussion
15.30 Closure, with drinks etc.

More details on the program will be made available soon.

REGISTRATION
Participation (lunch included) is free for all SIKS-members, but an early registration is required. Participants are kindly requested to fill in the registration form at the SIKS-site.
Deadline for registration: May 20, 2006.

Agent Systems Summer School for SIKS-Ph.D. students

From July 17-21, 2006, the eighth edition of the European Agent Systems Summer School (EASSS 2006) takes place in Annecy, France. Details on program and location can be found at http://www.esia.univ-savoie.fr/index.php?id=233.

As a result of the cooperation between SIKS and the EASSS 2006 organization, SIKS-Ph.D. students can participate without paying entrance fee. The summer school is part of the advanced components stage of the school's educational program and therefore Ph.D. students working in the field of agent systems are strongly encouraged to participate.

However, there is a fixed number of places available for SIKS-Ph.D. students at the summer school, and therefore an early registration is required. Deadline: May 8, 2006.

A free participation as a SIKS-Ph.D. student is only possible by submitting the electronic registration form that can be found at http://www.siks.nl/act/inschrijving_easss_2006.html. Ph.D. students will receive a notification whether they can participate as soon as possible.

So, do not contact the EASSS organization for questions about this SIKS-arrangement and do not use the registration form at the EASSS-site. For all questions regarding SIKS and its educational program, please contact office@siks.nl.

First Dutch/Belgian Day on Enterprise Information Systems (EIS 2006)

On September, 8, 2006 SIKS organizes the First Dutch/Belgian day on Enterprise Information Systems in conference center Hoog-Brabant in Utrecht.

The purpose of EIS 2006 is to bring together Dutch/Belgian junior and senior researchers interested in the advances and business applications of information systems – a broad field, including topics such as Management Information Systems, E-Business, IS Analysis and Design, Business Innovation, Knowledge Management, Business Process Management, Product Software Development, Coordination and Communication, Collaborative Information Systems and many others. EIS 2006 is organized by the research school SIKS as a unique opportunity for research groups from both the Computer Science side and the Management side to meet and interact. EIS 2006 is intended to be the first in a yearly EIS-tradition as a way of reinforcing the Information Systems field – in terms of both scientific ambition and industrial relevance.

This first year, the theme of EIS is: "Information Systems – defining the field". In the morning session, Roel Wieringa (Universiteit Twente) will introduce this theme and present his view on Information Systems as a scientific discipline and its research methods. After reactions from Monique Snoeck (KU Leuven) and Jaap Gordijn (VU Amsterdam), there will be a plenary discussion on this topic. In the afternoon session, a tour d'horizon of state-of-the-art EIS research is provided by presentations of Herman Balsters (RU Groningen), Erik Beulen (Universiteit Tilburg/Atos Origin), both on aspects of outsourcing, and others to be announced.

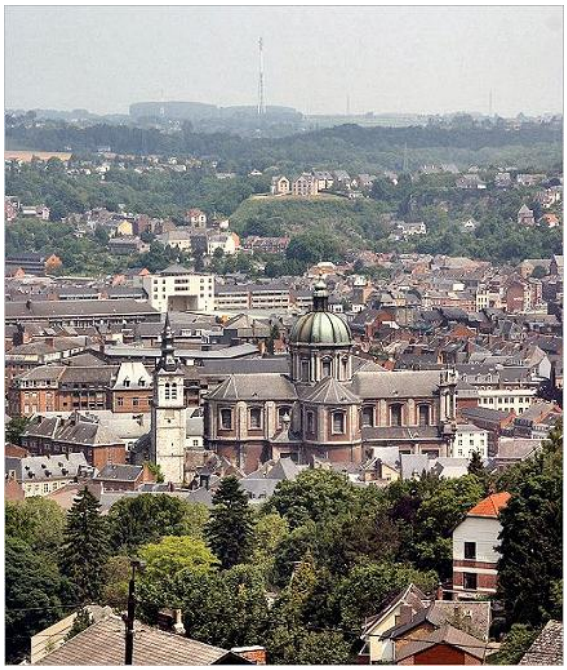
The day, chaired by Hans Weigand (Universiteit Tilburg), is organized by the research school SIKS and also open for EIS practitioners or interested researchers from other fields. Entrance, including lunch, is free, but prior registration is required. For more information, contact the SIKS office office@siks.nl.

ANNOUNCEMENTS

Call for Papers BNAIC 2006

October 5-6, 2006
University of Namur, Belgium

The BNAIC 2006 event will be held in the University of Namur under the auspices of the Belgian-Dutch Association for Artificial Intelligence (BNVKI) and the Dutch research school for Information and Knowledge Systems (SIKS).


The beautiful city of Namur.

The conference aims at presenting an overview of state-of-the art research in artificial intelligence in Belgium and The Netherlands.

TOPICS

Possible topics of submissions include:

- Multi-Agent Systems
- Intelligent Agents
- Robotics
- Logic in AI
- Games
- Search
- Verification and Validation
- Logic Programming
- Knowledge-based Systems
- Knowledge Representation
- Knowledge Management
- Ontologies
- Machine Learning
- Optimisation
- Evolutionary Algorithms
- Neural Networks
- Knowledge Discovery and Data Mining
- Natural Language Processing
- Cognitive Modeling
- Speech Recognition
- Handwriting Recognition
- Applications
- AI in Law, Music & Art
- Other

SUBMISSION

Submissions of the following three types are invited:

Type A: Regular Papers

Papers presenting new original work. Submitted papers should not exceed a length of 8 pages. These papers will be reviewed on overall quality and relevance. A-Papers will be accepted for either oral or poster presentation. Accepted papers will be fully published in the proceedings.

Type B: Compressed Contributions

AI papers that have been accepted after June 1st, 2005 at other refereed conferences or journals can be resubmitted and will be accepted as compressed contributions. Authors are invited to submit the officially published version (without page restriction) together with a one or two-page abstract. B-Papers will be accepted for either oral or poster presentation. The abstract of the paper will be published in the proceedings. Every author may submit at most 1 B-paper of which they are the corresponding author, and only if they do not submit any A-paper as corresponding author. Note that a separate author registration is required for each B-type contribution.

Type C: Demonstrations and Applications

Proposals for demonstrations will be evaluated based on submitted demonstration summaries (in English) stating the following: the purpose of the system to be demonstrated, its user groups, the organisation or project for which it is developed, the developers, and the technology used. In addition, the system requirements and the duration (not exceeding 30 minutes) should be mentioned. Researchers from industry are especially encouraged to submit papers presenting their applications and experiences. The maximum size of demonstration summaries is 2 pages.

Papers and demonstration summaries should be submitted electronically. More details can be found at the BNAIC 2006 site: www.BNAIC2006.be.

Submissions should be accompanied by a message stating the submission type (A, B, or C) and an abstract of the paper in plain text. Proper receipt of submissions will be acknowledged by e-mail. The deadline for submissions is June 1st, 2006. Submission implies willingness of at least one author to register for BNAIC and present the paper. For each paper, a separate author registration is required. Authors keep the copyright of their submissions. The BNAIC Proceedings are published under ISSN series number 1568-7805.

IMPORTANT DATES

Deadline for submissions	June 1, 2006
Notification of acceptance	July 7, 2006
Deadline for camera-ready papers	September 7, 2006

Namur's Belfry Tower on the Place des Armes.

Call for Participation Summer Course on Data Mining

July 3-7, 2006
Maastricht, The Netherlands

INTRODUCTION

Data mining is a relatively new scientific field that enables finding interesting knowledge (patterns, models and relationships) in very large databases. It is the most essential part of the knowledge-discovery process and has the potential to predict events or to analyse them in retrospect. Data mining has elements of databases, statistics, artificial intelligence, and machine learning.

WHY DATA MINING

A typical database contains data, information or even knowledge if the appropriate queries are submitted and answered. The situation changes if you have to analyse large databases with many variables. Elementary database queries and standard statistical analysis are not sufficient to answer your information need. Your intuition guides you to understand that the database contains more knowledge on a specific topic that you would like to know explicitly. Data mining can assist you in discovering this knowledge. The course shows you within five days how this works. You will learn new techniques, new methods, and tools of data mining. Hands-on education is involved.

COURSE DESCRIPTION

The course focuses on techniques with a direct practical use. A step-by-step introduction to powerful (freeware) data-mining tools will enable you to achieve specific skills, autonomy and hands-on experience. A number of real data sets will be analysed and discussed. In the end of the course you will have your own ability to apply data-mining techniques for research purposes and business purposes.

COURSE CONTENT

- The Knowledge Discovery Process
- Preparing Data for Mining
- Basic Techniques for Data Mining
  - Decision-Tree Induction
  - Rule Induction
  - Instance-Based Learning
  - Neural Networks
  - Bayesian Learning
  - Support Vector Machines
  - Ensemble Techniques
  - Clustering
  - Association Rules
- Tools for Data Mining
- How to Interpret and Evaluate Data Mining Results

INTENDED AUDIENCE

This course is intended for four groups of data-mining beginners: students, scientists, engineers and experts in specific fields who need to apply data-mining techniques to their scientific research, business management, or other related applications.

Participating in this course is a part of the advanced components stage of SIKS' educational program. SIKS has reserved a number of places for those Ph.D. students working on the course topics.

PREREQUISITES

The course does not require any background in databases, statistics, artificial intelligence, or machine learning. A general background in science is sufficient as is a high degree of enthusiasm for new scientific approaches.

Further information and registration:
http://www.cs.unimaas.nl/datamining/2006

CONFERENCES, SYMPOSIA WORKSHOPS

Below, the reader finds a list of conferences, symposia and workshops, and websites or addresses for further information.

MAY 8-11, 2006
International Conference on Computational Science and its Applications (ICCSA'2006). Glasgow, UK.
http://www.iccsa.org/

MAY 8-12, 2006
Fifth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS'06). Future University, Hakodate, Japan.
http://www.fun.ac.jp/aamas2006/

MAY 10, 2006
Workshop on Knowledge Discovery and Emergent Complexity in BioInformatics (KDECB'2006). Organised in connection with the Fifteenth Belgium-Netherlands Conference on Machine Learning (May 11-12, 2006). Ghent, Belgium.
http://www.biomicc.unimaas.nl/KDECB/

MAY 22-24, 2006
2006 IEEE Symposium on Computational Intelligence and Games (CIG'06). University of Nevada, Reno/Lake Tahoe, USA.
http://www.cse.unr.edu/~sushil/cig06/

MAY 22-26, 2006
15th World Wide Web Conference (WWW'2006). Edinburgh, Scotland.
http://www2006.org

MAY 23, 2006
First International Workshop on Semantic Web Annotations for Multimedia (SWAMM'2006). To be held as part of the 15th World Wide Web Conference (WWW'2006). Edinburgh, Scotland.
http://multimedia.semanticweb.org/SWAMM06/

MAY 28-31, 2006
International Conference on Computational Science (ICCS'2006). Reading, UK.
http://www.iccs-meeting.org/iccs2006/

MAY 26-31, 2006
The Computers and Games Conference 2006 (CG2006). Torino, Italy.
http://www.icga.org

MAY 29 - JUNE 2, 2006
SIKS-course on System Modeling and Knowledge Modeling. Vught, The Netherlands.
http://www.siks.nl

MAY 30 - JUNE 1, 2006
First International Conference on Scalable Information Systems (INFOSCALE). Hong Kong.
http://www.infoscale.org/

JUNE 5-6, 2006
Workshop on Development and Deployment of Product Software (DDoPS'06). Luxembourg.
http://www.cs.uu.nl/~xu/conferences/DDoPS06.htm

JUNE 6, 2006
The Second Twente Data Management Workshop (TDM'06) on Uncertainty in Databases. University of Twente, Enschede, The Netherlands.
http://www.cs.utwente.nl/~tdm

JUNE 6, 2006
International Workshop on Web Information Systems Modeling (WISM 2006). Held in conjunction with CAiSE 2006. Luxembourg.
http://wwwis.win.tue.nl/~flaviusf/workshops/wism2006

JUNE 6-7, 2006
Workshop on AI Planning for Computer Games and Synthetic Characters. Lake District, UK.

JUNE 14-19, 2006
29th Annual German Conference on Artificial Intelligence. Bremen, Germany.
http://www.ai-conference.de/ki06/

JUNE 15, 2006
EU Spam Symposium 2006, Maastricht, The Netherlands.
http://www.euspamsymposium.org

JUNE 15-17, 2006
The 4th biannual FOODSIM conference. University of Naples Federico II, Naples, Italy.
http://biomath.ugent.be/~eurosis/conf/foodsim/foodsim2006/

JUNE 18-21, 2006
Workshop on State-of-the-Art in Scientific and Parallel Computing (PARA'06). Umea, Sweden.
http://www.hpc2n.umu.se/para06/

JUNE 19-22, 2006
Summer School: Space, time and the organization of life, Heeze, The Netherlands.
http://www.cls.nl

JULY 13-15, 2006
7th Conference on Logic and the Foundations of Game and Decision Theory. Liverpool, UK.
http://www.csc.liv.ac.uk/~wiebe/LOFT06

JULY 16-21, 2006
IEEE World Congress on Computational Intelligence 2006 (WCCI'2006). Vancouver, Canada.
www.wcci2006.org

JULY 24-27, 2006
The 8th International Computer Games Conference (CGAMES'2006). Louisville, Kentucky, USA.
http://www.scit.wlv.ac.uk/~cm1822/cgames06usa.htm

AUGUST 1-5, 2006
International Conference on Informatics in Control, Automation and Robotics (ICINCO'2006). Setúbal, Portugal.
http://www.icinco.org

AUGUST 16-21, 2006
Third International Joint Conference on Automated Reasoning (IJCAR 2006). Seattle, USA.
http://ijcar06.uni-koblenz.de/

AUGUST 17-20, 2006
22nd International Conference on Logic Programming. Seattle, Washington, USA.
http://www.cs.uky.edu/iclp06/

AUGUST 28 – SEPTEMBER 1, 2006
17th European Conference on Artificial Intelligence (ECAI'06). Riva del Garda, Italy.
http://ecai2006.itc.it/

SEPTEMBER 3-6, 2006
The 3rd IFIP International Conference on Ubiquitous Intelligence and Computing (UIC-06), Wuhan and Three Gorges, China.
http://www.uic-conference.org/2006/

SEPTEMBER 10-14, 2006
International Conference on Artificial Neural Networks (ICANN 06), Holiday Inn Hotel, Athens, Greece.
http://www.icann2006.org

SEPTEMBER 13-15, 2006
10th European Conference on Logics in Artificial Intelligence (JELIA'06). Liverpool, UK.
http://www.csc.liv.ac.uk/~jelia

SEPTEMBER 18-22, 2006
13th ISPE, International Conference on Concurrent Engineering: Research and Applications, Antibes, French Riviera.
http://www.ce2006.org

SEPTEMBER 19-21, 2006
2nd Annual North American Game-On Conference (GameOn'NA 2006). Naval Postgraduate School, Monterey, USA.
http://biomath.ugent.be/~eurosis/conf/gameon-na/gameon-na2006/index.html

SEPTEMBER 20-22, 2006
The 5th International Conference on Entertainment Computing (ICEC'2006). Cambridge, Uk.
http://www.icec2006.org/

SEPTEMBER 28-30, 2006
IFSAM VIIIth World Congress 2006, Berlin, Germany
http://www.ctw-congress.de/ifsam/submissions.html

OCTOBER 16-18, 2006
The First International Workshop on Intelligent Application in Product Lifecycle Management (IAPLM'06). Jinan, Shandong, P. R. China.
http://www.iaplm.org

OCTOBER 23-25, 2006
ESM2006, The 2006 European Simulation and Modelling Conference, Toulouse, France
http://biomath.ugent.be/~eurosis/conf/esm/esm2006/

OCTOBER 25-27, 2006
First European conference on Smart Sensing and Context (EuroSSC 2006). Enschede, The Netherlands.
http://www.EuroSSC.org

NOVEMBER 5-9, 2006
Fifth International Semantic Web Conference (ISWC 2006), Athens, Georgia, USA.
http://www.win.tue.nl/~laroyo/

NOVEMBER 7-10, 2006
5th International Symposium on Formal Methods for Objects and Components FMCO 2006. CWI, Amsterdam, The Netherlands.
http://fmco.liacs.nl/fmco06.html

DECEMBER 4-6, 2006
Second IEEE International Conference on e-Science. Amsterdam, The Netherlands.
http://www.escience-meeting.org/eScience2006

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COPY

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