Anhang D

Layoutanalyse

1.1 "MediaTeam" Dokumentdatenbank

Zu sehen ist das Resultat der Layouterkennung auf den Dokumenten der "MediaTeam" Datenbank. Die produzierten Ergebnisse und die vorgegebenen Referenzdaten werden gegenübergestellt. Die ermittelte Vorlesereihenfolge wird mit Hilfe der Linien gekennzeichnet. Die grünen Linien auf den linken Aufnahmen markieren dabei Übergänge zwischen den erkannten Abschnitten und blaue Linien zwischen den Textregionen innerhalb der einzelnen Abschnitte.

In erster Linie wurde die Fähigkeit des Algorithmus evaluiert, Textregionen zu identifizieren. Ein Klassifizierungsfehler liegt dementsprechend dann vor, wenn zu einer vorgegebenen Textregion kein Textsegment identifiziert werden konnte, dessen Mittelpunkt in der Nähe der Ground-Truth-Koordinaten liegt. Der tolerierte Abweichungsbereich wurde in Abhängigkeit von den Ausmaßen der jeweiligen Region festgelegt, wobei Regionen mit einer geringen Größe aus der Bewertung herausgenommen wurden. Des Weiteren wurde die vorgegebene Vorlesereihenfolge mit der ermittelten verglichen. Für jede Ground-Truth-Nachbarschaftsbeziehung wurde kontrolliert, ob diese konform mit der berechneten Anordnung ist. Die Auswertung wurde dabei einerseits dadurch erschwert, dass für viele Dokumente der MediaTeam Datenbank keine Totalordnung vorgegeben ist, weshalb in bestimmten Fällen keine Aussagen über die Richtigkeit der erkannten Anordnung gemacht werden konnte. Andererseits führte die Untersegmentierungsproblematik gelegentlich dazu, dass für einige der Ground-Truth-Relationen keine Entsprechung in der berechneten Abfolge gefunden wurde. Infolge dieser Beobachtungen wurde die Auswertung wie folgt vorgenommen:

- Für jede der vorgegebenen Nachbarschaftsrelationen $relation(R_i, R_j)$, $i > j$ wurde in der berechneten Partitionierung nach den Entsprechungen für die beiden Regionen R'_i, R'_j unter Verwendung der Mittelpunkt-Koordinaten gesucht
- Falls eine Regionen nicht gefunden werden konnte, dann wurde ein Versuch unternommen aufeinanderfolgende Ground-Truth-Regionen zu kombinieren und auf diese Weise die Untersegmentierungsproblematik zu lösen

- Es wurde kontrolliert, ob die transitive Hülle der berechneten Nachbarschaftsrelationen die Relation $relation(R'_i, R'_j)$ enthält
- Im Erfolgsfall wurde die Relation $relation(R_i, R_j)$ selbst sowie die u. U. bei der Verschmelzung der Regionen verwendeten Relationen als korrekt erkannt markiert

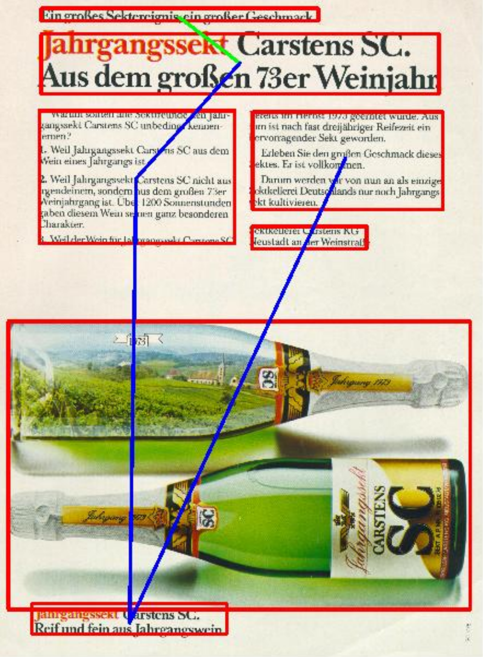
Tabelle 1: Auswertung der Layouterkennung auf den Dokumenten der MediaTeam DB.

MediaTeam Dokument	**Region** Korrekt/Gesamt	**Vorlesereihenfolge** Korrekt/Gesamt
1.	5/8	5/7
2.	9/9	5/5
3.	15/19	5/5
4.	11/12	5/5
5.	7/8	5/5
6.	4/5	3/3
7.	6/16	12/12
8.	4/8	5/5
9.	2/4	3/3
10.	3/4	3/3
11.	5/7	4/6
12.	6/7	4/4
13.	8/10	5/5
14.	10/16	11/12

15.	12/16	8/10
16.	11/11	7/7
17.	7/11	5/7
18.	5/14	12/12
19.	1/4	2/2
20.	0/2	1/1
Gesamt	**131/191**	**110/119**

Ergebnis der Verarbeitung

Referenzdaten



Ein großes Sektereignis, ein großer Geschmack.

Jahrgangssekt Carstens SC.
Aus dem großen 73er Weinjahr.

Warum sollten alle Sektfreunde den Jahrgangssekt Carstens SC unbedingt kennenlernen?

1. Weil Jahrgangssekt Carstens SC aus dem Wein eines Jahrgangs ist.

2. Weil Jahrgangssekt Carstens SC nicht aus irgendeinem, sondern aus dem großen 73er Weinjahrgang ist. Über 1200 Sonnenstunden gaben diesem Wein seinen ganz besonderen Charakter.

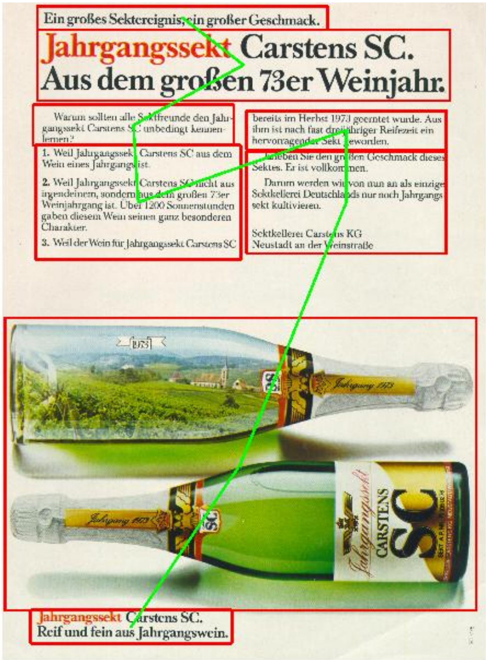
3. Weil der Wein für Jahrgangssekt Carstens SC bereits im Herbst 1973 geerntet wurde. Aus ihm ist nach fast dreijähriger Reifezeit ein hervorragender Sekt geworden.

Erleben Sie den großen Geschmack dieses Sektes. Er ist vollkommen.

Darum werden wir von nun an als einzige Sektkellerei Deutschlands nur noch Jahrgangssekt kultivieren.

Sektkellerei Carstens KG
Neustadt an der Weinstraße

Jahrgangssekt Carstens SC.
Reif und fein aus Jahrgangswein.



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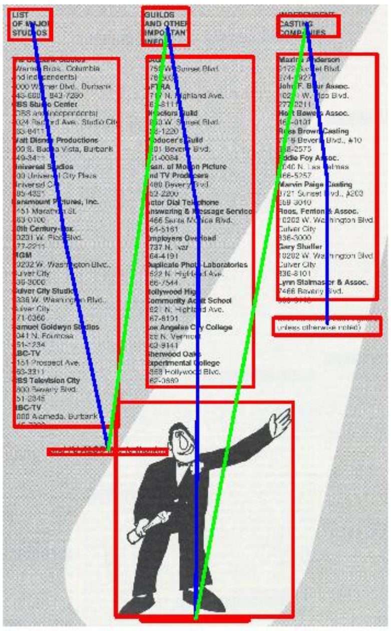

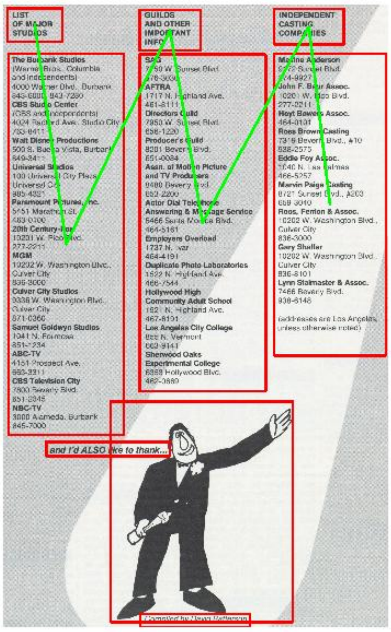

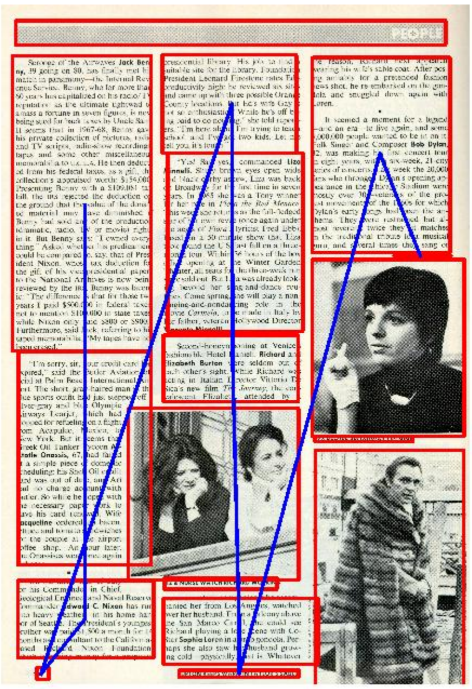
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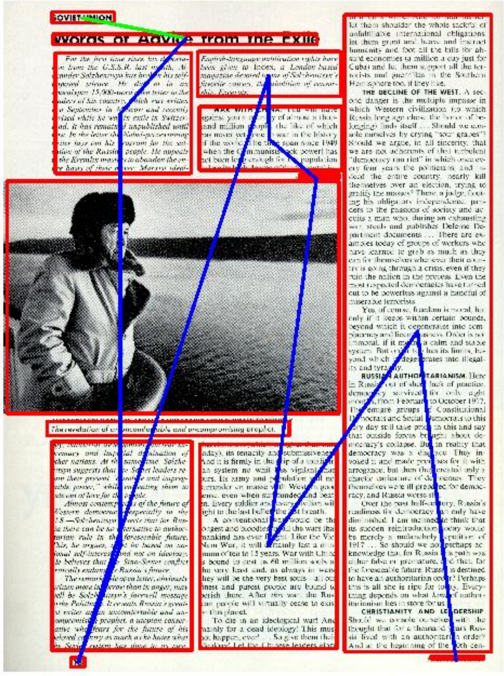
SOVIET UNION
Words of Advice from the Exile
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SOVIET UNION
Words of Advice from the Exile
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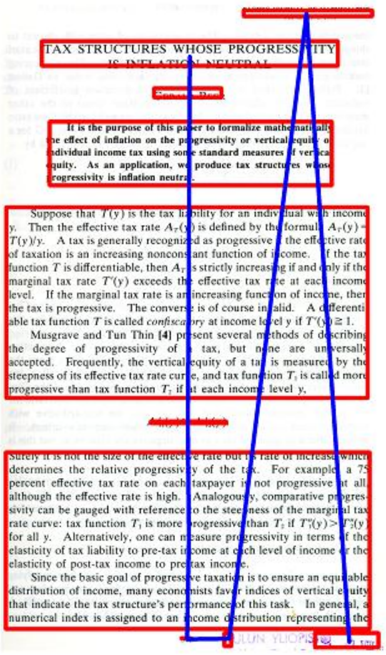
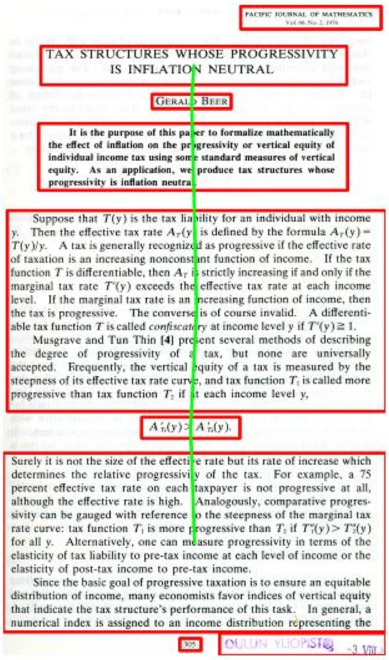
TIME, MARCH 11, 1974





PACIFIC JOURNAL OF MATHEMATICS
Vol. 66, No. 2, 1976

TAX STRUCTURES WHOSE PROGRESSIVITY IS INFLATION NEUTRAL

GERALD BEER

It is the purpose of this paper to formalize mathematically the effect of inflation on the progressivity or vertical equity of individual income tax using some standard measures of vertical equity. As an application, we produce tax structures whose progressivity is inflation neutral.

Suppose that $T(y)$ is the tax liability for an individual with income y. Then the effective tax rate $A_T(y)$ is defined by the formula $A_T(y) = T(y)/y$. A tax is generally recognized as progressive if the effective rate of taxation is an increasing nonconstant function of income. If the tax function T is differentiable, then A_T is strictly increasing if and only if the marginal tax rate $T'(y)$ exceeds the effective tax rate at each income level. If the marginal tax rate is an increasing function of income, then the tax is progressive. The converse is of course invalid. A differentiable tax function T is called *confiscatory* at income level y if $T'(y) \geqq 1$.

Musgrave and Tun Thin [4] present several methods of describing the degree of progressivity of a tax, but none are universally accepted. Frequently, the vertical equity of a tax is measured by the steepness of its effective tax rate curve, and tax function T_1 is called more progressive than tax function T_2 if at each income level y,

$$A'_{T_1}(y) \geq A'_{T_2}(y).$$

Surely it is not the size of the effective rate but its rate of increase which determines the relative progressivity of the tax. For example, a 75 percent effective tax rate on each taxpayer is not progressive at all, although the effective rate is high. Analogously, comparative progressivity can be gauged with reference to the steepness of the marginal tax rate curve: tax function T_1 is more progressive than T_2 if $T''_1(y) > T''_2(y)$ for all y. Alternatively, one can measure progressivity in terms of the elasticity of tax liability to pre-tax income at each level of income or the elasticity of post-tax income to pre-tax income.

Since the basic goal of progressive taxation is to ensure an equitable distribution of income, many economists favor indices of vertical equity that indicate the tax structure's performance of this task. In general, a numerical index is assigned to an income distribution representing the

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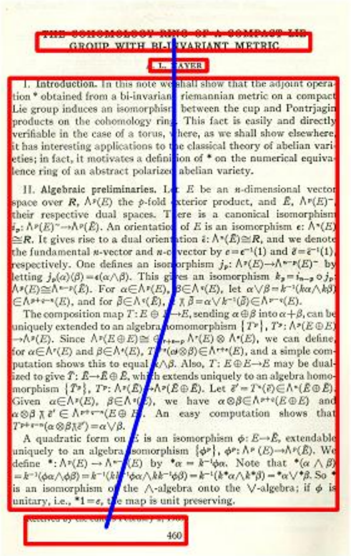
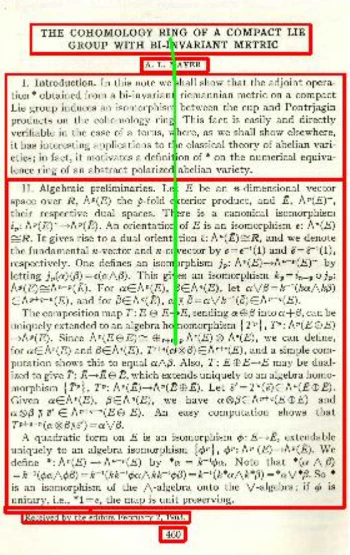




THE COHOMOLOGY RING OF A COMPACT LIE GROUP WITH BI-INVARIANT METRIC

A. L. MAYER

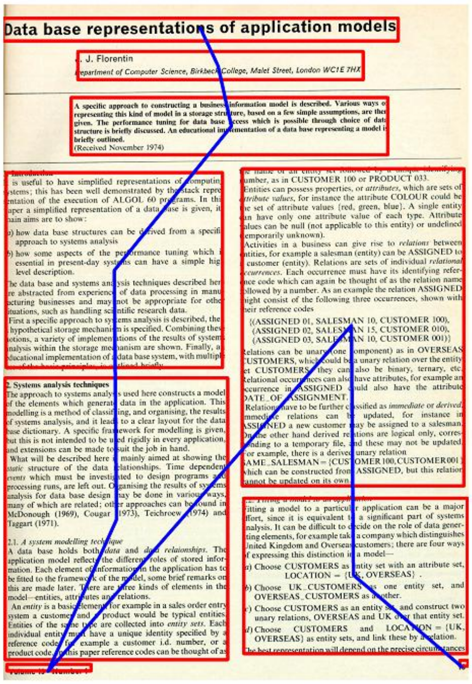
I. Introduction. In this note we shall show that the adjoint operation * obtained from a bi-invariant riemannian metric on a compact Lie group induces an isomorphism between the cup and Pontrjagin products on the cohomology ring. This fact is easily and directly verifiable in the case of a torus, where, as we shall show elsewhere, it has interesting applications to the classical theory of abelian varieties; in fact, it motivates a definition of * on the numerical equivalence ring of an abstract polarized abelian variety.

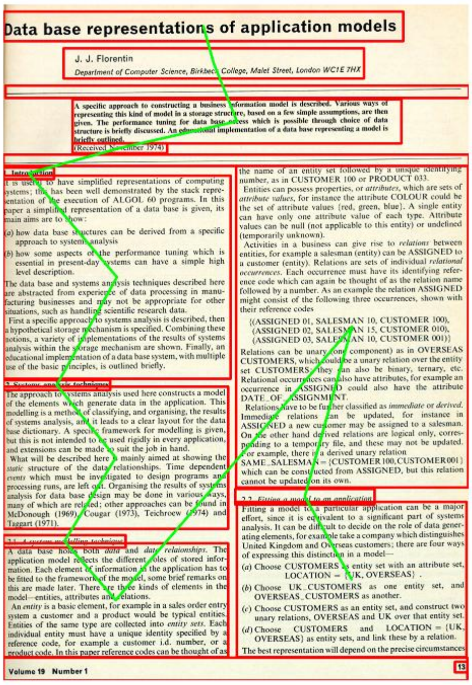
II. Algebraic preliminaries. Let E be an n-dimensional vector space over R, $\Lambda^p(E)$ the p-fold exterior product, and $\bar{E}$, $\Lambda^p(E)^-$, their respective dual spaces. There is a canonical isomorphism $i_p\colon \Lambda^p(E)^- \to \Lambda^p(\bar{E})$. An orientation of E is an isomorphism $\epsilon\colon \Lambda^n(E) \cong R$. It gives rise to a dual orientation $\bar{\epsilon}\colon \Lambda^n(\bar{E}) \cong R$, and we denote the fundamental n-vector and n-covector by $e = \epsilon^{-1}(1)$ and $\bar{e} = \bar{\epsilon}^{-1}(1)$, respectively. One defines an isomorphism $j_p\colon \Lambda^p(E) \to \Lambda^{n-p}(E)^-$ by letting $j_p(\alpha)(\beta) = \epsilon(\alpha \wedge \beta)$. This gives an isomorphism $k_p = i_{n-p} \circ j_p\colon \Lambda^p(E) \cong \Lambda^{n-p}(\bar{E})$. For $\alpha \in \Lambda^p(E)$, $\beta \in \Lambda^q(E)$, let $\alpha \vee \beta = k^{-1}(k\alpha \wedge k\beta) \in \Lambda^{p+q-n}(E)$, and for $\bar{\beta} \in \Lambda^q(\bar{E})$, $\alpha \barwedge \bar{\beta} = \alpha \vee k^{-1}(\bar{\beta}) \in \Lambda^{p-q}(E)$.

The composition map $T\colon E \oplus E \to E$, sending $\alpha \oplus \beta$ into $\alpha + \beta$, can be uniquely extended to an algebra homomorphism $\{T^p\}$, $T^p\colon \Lambda^p(E \oplus E) \to \Lambda^p(E)$. Since $\Lambda^p(E \oplus E) \cong \oplus_{r+s=p} \Lambda^r(E) \otimes \Lambda^s(E)$, we can define, for $\alpha \in \Lambda^r(E)$ and $\beta \in \Lambda^s(E)$, $T^{r+s}(\alpha \otimes \beta) \in \Lambda^{r+s}(E)$, and a simple computation shows this to equal $\alpha \wedge \beta$. Also, $T\colon E \oplus E \to E$ may be dualized to give $\bar{T}\colon \bar{E} \to \bar{E} \oplus \bar{E}$, which extends uniquely to an algebra homomorphism $\{\bar{T}^p\}$, $\bar{T}^p\colon \Lambda^p(\bar{E}) \to \Lambda^p(\bar{E} \oplus \bar{E})$. Let $\bar{e}' = \bar{T}^n(\bar{e}) \in \Lambda^n(\bar{E} \oplus \bar{E})$. Given $\alpha \in \Lambda^p(E)$, $\beta \in \Lambda^q(E)$, we have $\alpha \otimes \beta \in \Lambda^{p+q}(E \oplus E)$ and $\alpha \otimes \beta \barwedge \bar{e}' \in \Lambda^{p+q-n}(E \oplus E)$. An easy computation shows that $T^{p+q-n}(\alpha \otimes \beta \barwedge \bar{e}') = \alpha \vee \beta$.

A quadratic form on E is an isomorphism $\phi\colon E \to \bar{E}$, extendable uniquely to an algebra isomorphism $\{\phi^p\}$, $\phi^p\colon \Lambda^p(E) \to \Lambda^p(\bar{E})$. We define $^*\colon \Lambda^p(E) \to \Lambda^{n-p}(E)$ by $^*\alpha = k^{-1}\phi\alpha$. Note that $^*(\alpha \wedge \beta) = k^{-1}(\phi\alpha \wedge \phi\beta) = k^{-1}(kk^{-1}\phi\alpha \wedge kk^{-1}\phi\beta) = k^{-1}(k^*\alpha \wedge k^*\beta) = {}^*\alpha \vee {}^*\beta$. So * is an isomorphism of the $\wedge$-algebra onto the $\vee$-algebra; if ϕ is unitary, i.e., $^*1 = e$, the map is unit preserving.

Received by the editors February 2, 1961.





Data base representations of application models

J. J. Florentin
Department of Computer Science, Birkbeck College, Malet Street, London WC1E 7HX

A specific approach to constructing a business information model is described. Various ways of representing this kind of model in a storage structure, based on a few simple assumptions, are then given. The performance tuning for data base access which is possible through choice of data structure is briefly discussed. An educational implementation of a data base representing a model is briefly outlined.

(Received November 1974)

1. Introduction

It is useful to have simplified representations of computing systems; this has been well demonstrated by the stack representation of the execution of ALGOL 60 programs. In this paper a simplified representation of a data base is given, its main aims are to show:

(*a*) how data base structures can be derived from a specific approach to systems analysis

(*b*) how some aspects of the performance tuning which is essential in present-day systems can have a simple high level description.

The data base and systems analysis techniques described here are abstracted from experience of data processing in manufacturing businesses and may not be appropriate for other situations, such as handling scientific research data.

First a specific approach to systems analysis is described, then a hypothetical storage mechanism is specified. Combining these notions, a variety of implementations of the results of systems analysis within the storage mechanism are shown. Finally, an educational implementation of a data base system, with multiple use of the basic principles, is outlined briefly.

2. Systems analysis techniques

The approach to systems analysis used here constructs a model of the elements which generate data in the application. This modelling is a method of classifying, and organising, the results of systems analysis, and it leads to a clear layout for the data base dictionary. A specific framework for modelling is given, but this is not intended to be used rigidly in every application, and extensions can be made to suit the job in hand.

What will be described here is mainly aimed at showing the *static* structure of the data relationships. Time dependent *events* which must be investigated to design programs and processing runs, are left out. Organising the results of systems analysis for data base design may be done in various ways, many of which are related; other approaches can be found in McDonough (1969), Cougar (1973), Teichroew (1974) and Taggart (1971).

2.1. *A system modelling technique*

A data base holds both *data* and *data relationships*. The application model reflects the different roles of stored information. Each element of information in the application has to be fitted to the framework of the model, some brief remarks on this are made later. There are three kinds of elements in the model—entities, attributes and relations.

An *entity* is a basic element, for example in a sales order entry system a customer and a product would be typical entities. Entities of the same type are collected into *entity sets*. Each individual entity must have a unique identity specified by a reference code, for example a customer i.d. number, or a product code. In this paper reference codes can be thought of as the name of an entity set followed by a unique identifying number, as in CUSTOMER 100 or PRODUCT 033.

Entities can possess properties, or *attributes*, which are sets of *attribute values*, for instance the attribute COLOUR could be the set of attribute values {red, green, blue}. A single entity can have only one attribute value of each type. Attribute values can be null (not applicable to this entity) or undefined (temporarily unknown).

Activities in a business can give rise to *relations* between entities, for example a salesman (entity) can be ASSIGNED to a customer (entity). Relations are sets of individual *relational occurrences*. Each occurrence must have its identifying reference code which can again be thought of as the relation name followed by a number. As an example the relation ASSIGNED might consist of the following three occurrences, shown with their reference codes

{(ASSIGNED 01, SALESMAN 10, CUSTOMER 100),
(ASSIGNED 02, SALESMAN 15, CUSTOMER 010),
(ASSIGNED 03, SALESMAN 10, CUSTOMER 001)}

Relations can be unary (one component) as in OVERSEAS CUSTOMERS, which could be a unary relation over the entity set CUSTOMERS; they can also be binary, ternary, etc. Relational occurrences can also have attributes, for example an occurrence in ASSIGNED could also have the attribute DATE_OF_ASSIGNMENT.

Relations have to be further classified as *immediate* or *derived*. Immediate relations can be updated, for instance in ASSIGNED a new customer may be assigned to a salesman. On the other hand derived relations are logical only, corresponding to a temporary file, and these may not be updated. For example, there is a derived unary relation SAME_SALESMAN = {CUSTOMER 100, CUSTOMER 001} which can be constructed from ASSIGNED, but this relation cannot be updated on its own.

2.2. *Fitting a model to an application*

Fitting a model to a particular application can be a major effort, since it is equivalent to a significant part of systems analysis. It can be difficult to decide on the role of data generating elements, for example take a company which distinguishes United Kingdom and Overseas customers; there are four ways of expressing this distinction in a model—

(*a*) Choose CUSTOMERS as entity set with an attribute set, LOCATION = {UK, OVERSEAS} .

(*b*) Choose UK_CUSTOMERS as one entity set, and OVERSEAS_CUSTOMERS as another.

(*c*) Choose CUSTOMERS as an entity set, and construct two unary relations, OVERSEAS and UK over that entity set.

(*d*) Choose CUSTOMERS and LOCATION = {UK, OVERSEAS} as entity sets, and link these by a relation.

The best representation will depend on the precise circumstances

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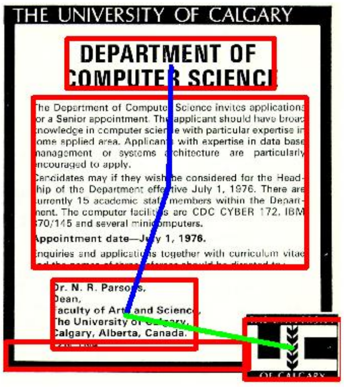
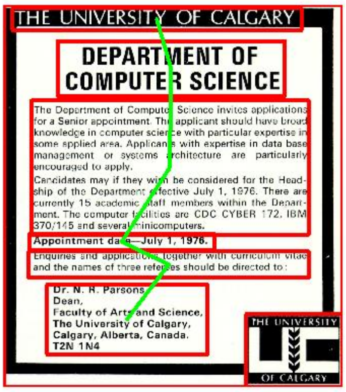




THE UNIVERSITY OF CALGARY

DEPARTMENT OF COMPUTER SCIENCE

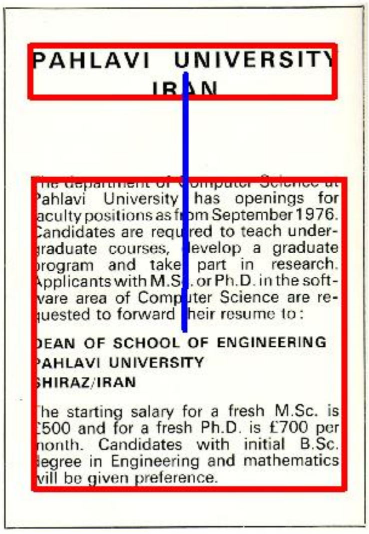
The Department of Computer Science invites applications for a Senior appointment. The applicant should have broad knowledge in computer science with particular expertise in some applied area. Applicants with expertise in data base management or systems architecture are particularly encouraged to apply.

Candidates may if they wish be considered for the Headship of the Department effective July 1, 1976. There are currently 15 academic staff members within the Department. The computer facilities are CDC CYBER 172, IBM 370/145 and several minicomputers.

Appointment date—July 1, 1976.

Enquiries and applications together with curriculum vitae and the names of three referees should be directed to:

**Dr. N. R. Parsons,
Dean,
Faculty of Arts and Science,
The University of Calgary,
Calgary, Alberta, Canada.
T2N 1N4**

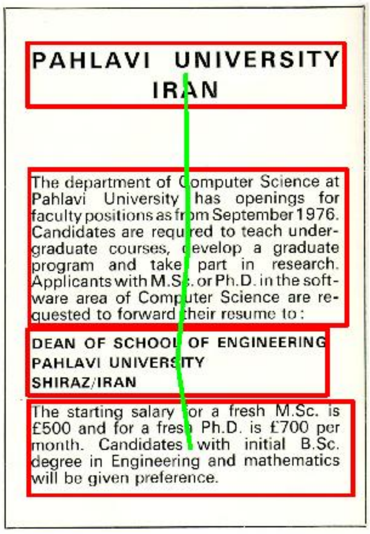


PAHLAVI UNIVERSITY
IRAN

The department of Computer Science at Pahlavi University has openings for faculty positions as from September 1976. Candidates are required to teach undergraduate courses, develop a graduate program and take part in research. Applicants with M.Sc. or Ph.D. in the software area of Computer Science are requested to forward their resume to:

DEAN OF SCHOOL OF ENGINEERING
PAHLAVI UNIVERSITY
SHIRAZ/IRAN

The starting salary for a fresh M.Sc. is £500 and for a fresh Ph.D. is £700 per month. Candidates with initial B.Sc. degree in Engineering and mathematics will be given preference.



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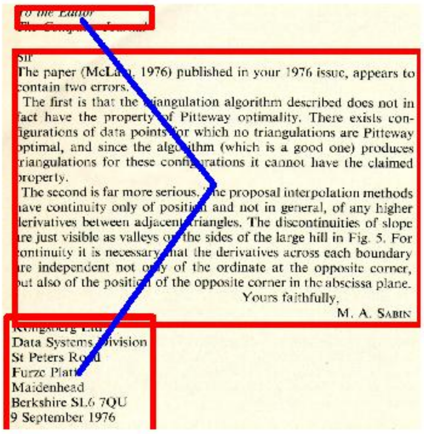


To the Editor
The Computer Journal

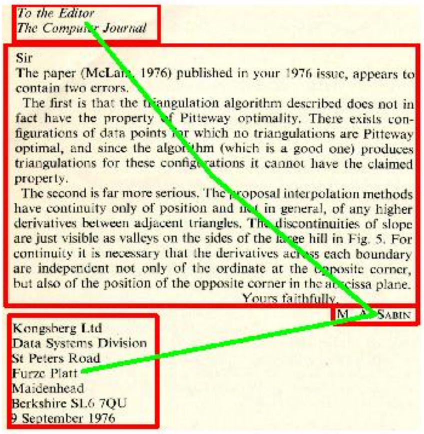
Sir
The paper (McLain, 1976) published in your 1976 issue, appears to contain two errors.

The first is that the triangulation algorithm described does not in fact have the property of Pitteway optimality. There exists configurations of data points for which no triangulations are Pitteway optimal, and since the algorithm (which is a good one) produces triangulations for these configurations it cannot have the claimed property.

The second is far more serious. The proposal interpolation methods have continuity only of position and not in general, of any higher derivatives between adjacent triangles. The discontinuities of slope are just visible as valleys on the sides of the large hill in Fig. 5. For continuity it is necessary that the derivatives across each boundary are independent not only of the ordinate at the opposite corner, but also of the position of the opposite corner in the abscissa plane.

Yours faithfully,
M. A. SABIN

Kongsberg Ltd
Data Systems Division
St Peters Road
Furze Platt
Maidenhead
Berkshire SL6 7QU
9 September 1976



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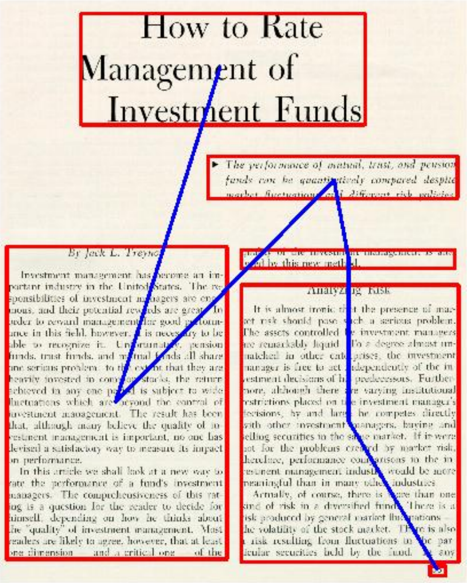
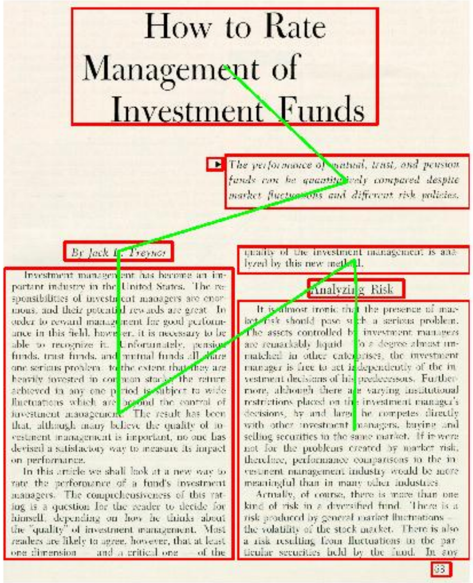


How to Rate Management of Investment Funds

By Jack L. Treynor



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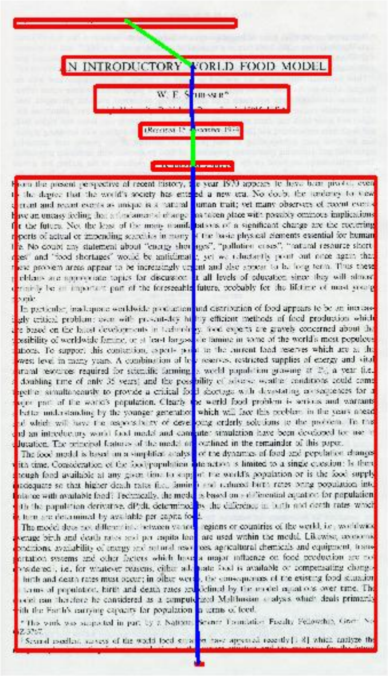
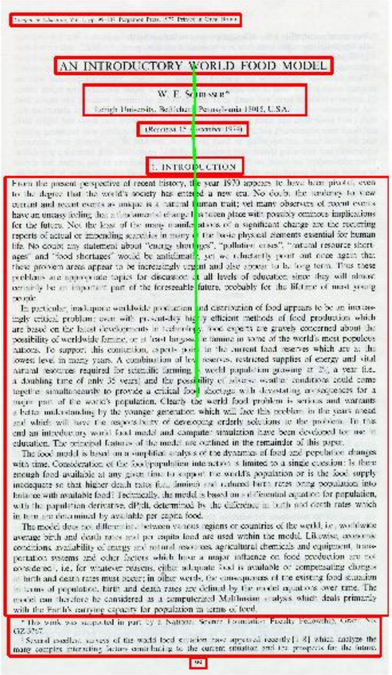
By Jack L. Treynor



AN INTRODUCTORY WORLD FOOD MODEL



AN INTRODUCTORY WORLD FOOD MODEL

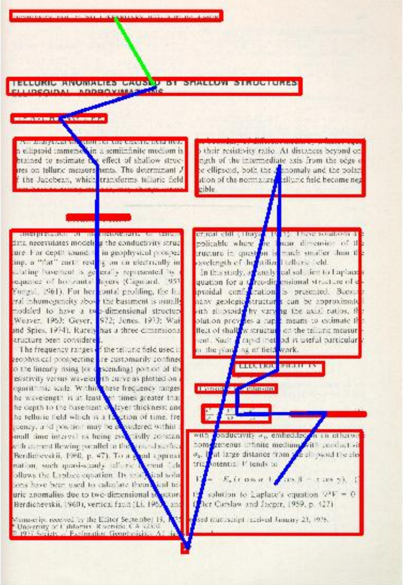
1. INTRODUCTION

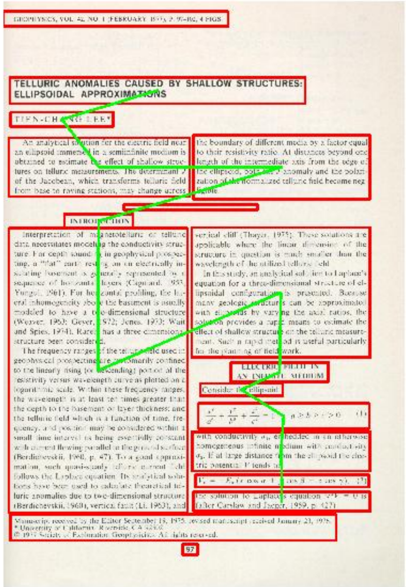
Leirikoulu tulee Suomeenkin

MATTI LEINONEN

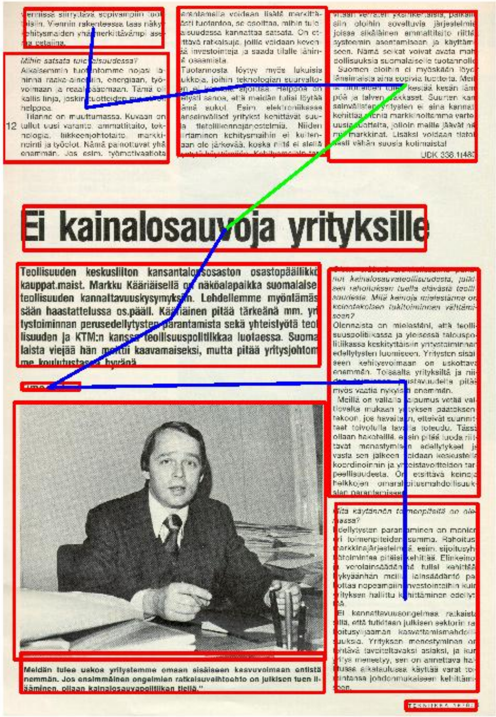
Leirikoulu tulee Suomeenkin

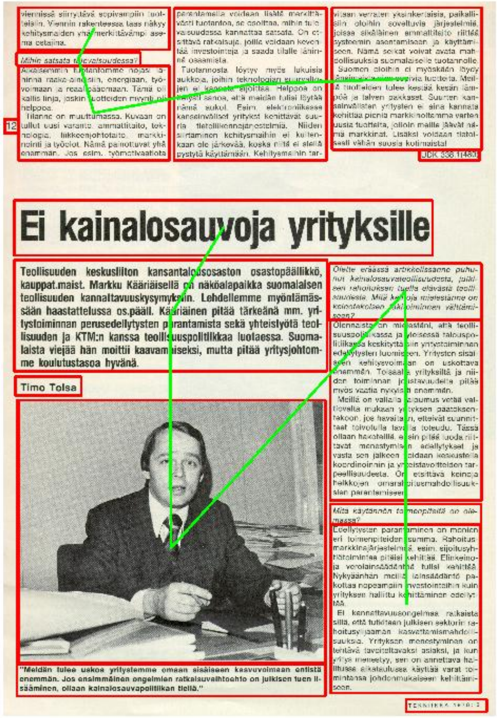
MATTI LEINONEN





TELLURIC ANOMALIES CAUSED BY SHALLOW STRUCTURES: ELLIPSOIDAL APPROXIMATIONS



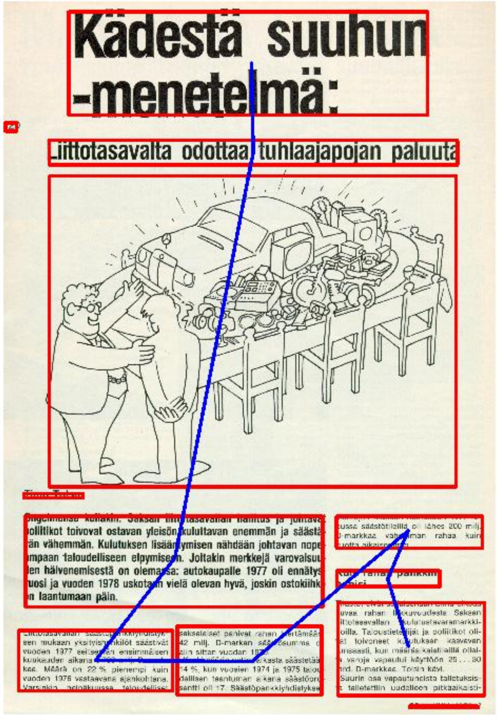


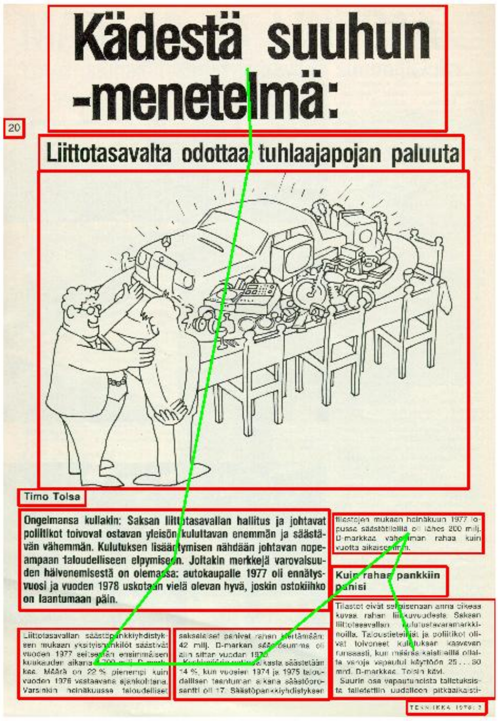
Ei kainalosauvoja yrityksille

Teollisuuden keskusliiton kansantaloussosaston osastopäällikkö, kauppat.maist. Markku Kääriäisellä on näköalapaikka suomalaisen teollisuuden kannattavuuskysymyksiin. Lehdellemme myöntämässään haastattelussa os.pääll. Kääriäinen pitää tärkeänä mm. yritystoiminnan perusedellytysten parantamista sekä yhteistyötä teollisuuden ja KTM:n kanssa teollisuuspolitiikkaa luotaessa. Suomalaista viejää hän moittii kaavamaiseksi, mutta pitää yritysjohtomme koulutustasoa hyvänä.

Timo Tolsa

"Meidän tulee uskoa yritystemme omaan sisäiseen kasvuvoimaan entistä enemmän. Jos ensimmäinen ongelmien ratkaisuvaihtoehto on julkisen tuen ilsääminen, ollaan kainalosauvapolitiikan tiellä."



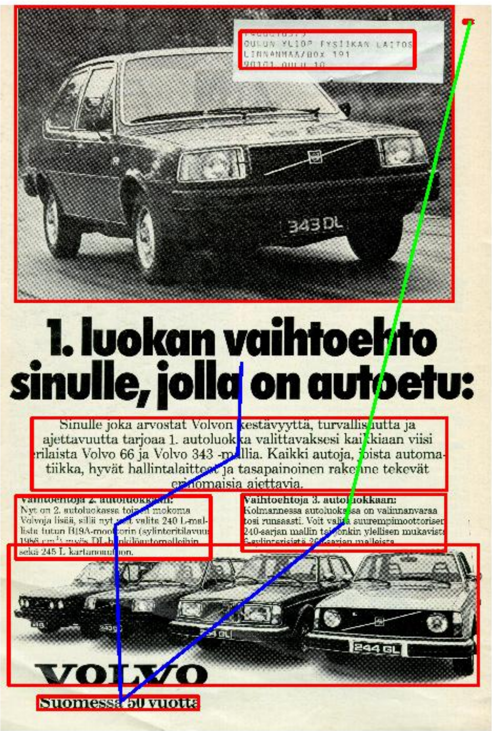


Kädestä suuhun -menetelmä:

Liittotasavalta odottaa tuhlaajapojan paluuta

Timo Tolsa

Ongelmansa kullakin: Saksan liittotasavallan hallitus ja johtavat poliitikot toivovat ostavan yleisön kuluttavan enemmän ja säästävän vähemmän. Kulutuksen lisääntymisen nähdään johtavan nopeampaan taloudelliseen elpymiseen. Joitakin merkkejä varovaisuuden hälvenemisestä on olemassa: autokaupalle 1977 oli ennätysvuosi ja vuoden 1978 uskotaan vielä olevan hyvä, joskin ostokiihko on laantumaan päin.



7400016375
OULUN YLIOP FYSIIKAN LAITOS
LINNANMAA/BOX 191
90101 OULU 10

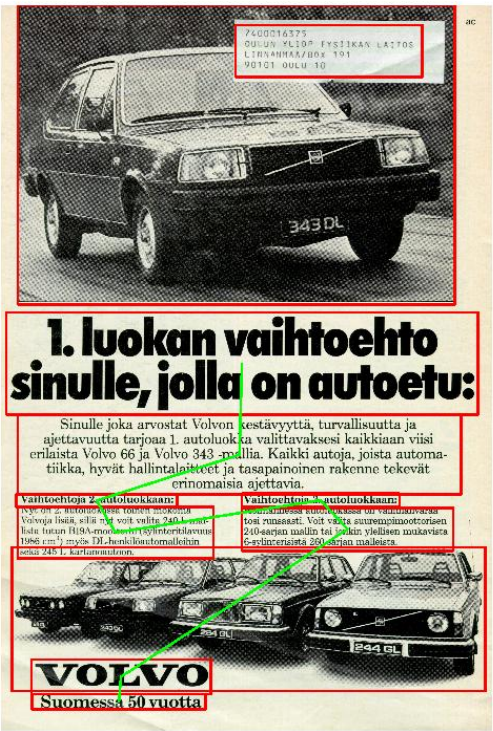
1. luokan vaihtoehto sinulle, jolla on autoetu:

Sinulle joka arvostat Volvon kestävyyttä, turvallisuutta ja ajettavuutta tarjoaa 1. autoluokka valittavaksesi kaikkiaan viisi erilaista Volvo 66 ja Volvo 343 -mallia. Kaikki autoja, joista automatiikka, hyvät hallintalaitteet ja tasapainoinen rakenne tekevät erinomaisia ajettavia.

Vaihtoehtoja 2. autoluokkaan:
Nyt on 2. autoluokassa toinen mokoma Volvoja lisää, sillä nyt voit valita 240 L-mallista tutun B19A-moottorin (sylinteritilavuus 1986 cm³) myös DL-henkilöautomalleihin sekä 245 L kartanoautoon.

Vaihtoehtoja 3. autoluokkaan:
Kolmannessa autoluokassa on valinnanvaraa tosi runsaasti. Voit valita suurempimoottorisen 240-sarjan mallin tai jonkin ylellisen mukavista 6-sylinterisistä 260-sarjan malleista.

VOLVO
Suomessa 50 vuotta



7400016375
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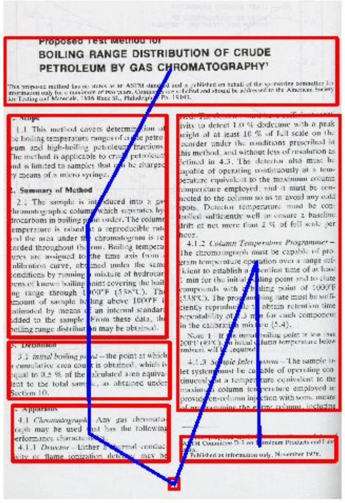
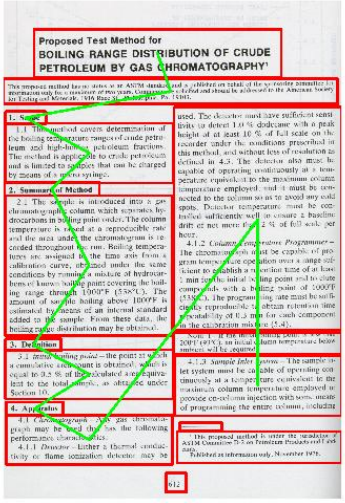


Proposed Test Method for
BOILING RANGE DISTRIBUTION OF CRUDE PETROLEUM BY GAS CHROMATOGRAPHY¹



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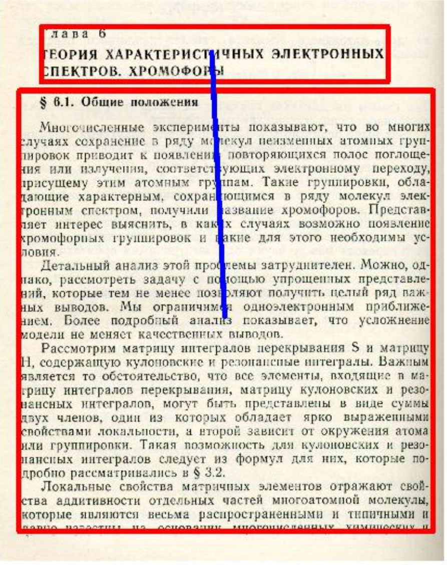


Глава 6

ТЕОРИЯ ХАРАКТЕРИСТИЧНЫХ ЭЛЕКТРОННЫХ СПЕКТРОВ. ХРОМОФОРЫ

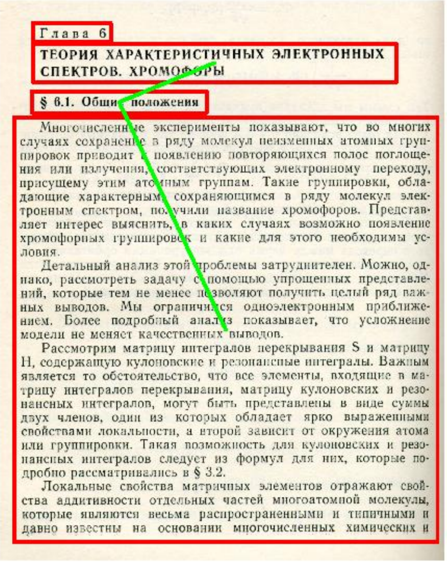
§ 6.1. Общие положения

Многочисленные эксперименты показывают, что во многих случаях сохранение в ряду молекул неизменных атомных группировок приводит к появлению повторяющихся полос поглощения или излучения, соответствующих электронному переходу, присущему этим атомным группам. Такие группировки, обладающие характерным, сохраняющимся в ряду молекул электронным спектром, получили название хромофоров. Представляет интерес выяснить, в каких случаях возможно появление хромофорных группировок и какие для этого необходимы условия.

Детальный анализ этой проблемы затруднителен. Можно, однако, рассмотреть задачу с помощью упрощенных представлений, которые тем не менее позволяют получить целый ряд важных выводов. Мы ограничимся одноэлектронным приближением. Более подробный анализ показывает, что усложнение модели не меняет качественных выводов.

Рассмотрим матрицу интегралов перекрывания S и матрицу H, содержащую кулоновские и резонансные интегралы. Важным является то обстоятельство, что все элементы, входящие в матрицу интегралов перекрывания, матрицу кулоновских и резонансных интегралов, могут быть представлены в виде суммы двух членов, один из которых обладает ярко выраженными свойствами локальности, а второй зависит от окружения атома или группировки. Такая возможность для кулоновских и резонансных интегралов следует из формул для них, которые подробно рассматривались в § 3.2.

Локальные свойства матричных элементов отражают свойства аддитивности отдельных частей многоатомной молекулы, которые являются весьма распространенными и типичными и давно известны на основании многочисленных химических и



Глава 6

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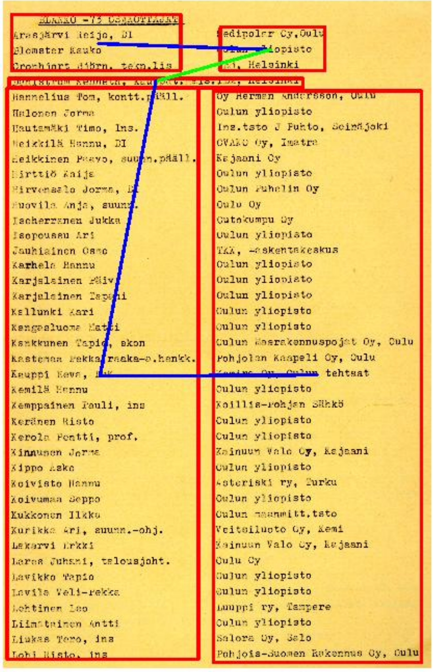
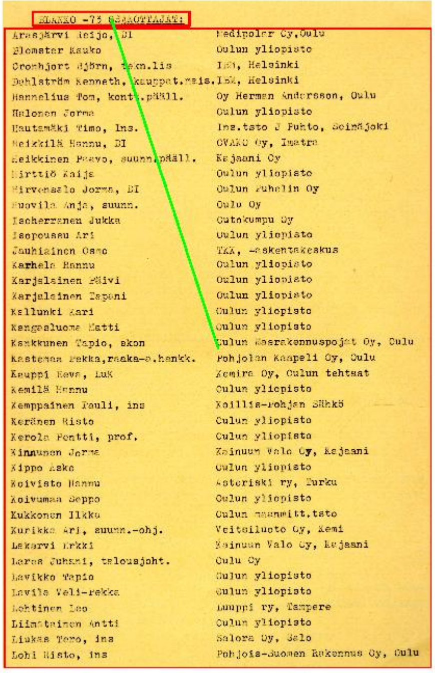


ELAKKO -73 OSANOTTAJAT:

Arasjärvi Reijo, DI	Medipolar Oy,Oulu
Blomster Kauko	Oulun yliopisto
Cronhjort Björn, tekn.lis	IBM, Helsinki
Dahlström Kenneth, kauppat.mais.	IBM, Helsinki
Hannelius Tom, kontt.pääll.	Oy Hermen Andersson, Oulu
Halonen Jorma	Oulun yliopisto
Hautamäki Timo, Ins.	Ins.tsto J Puhto, Seinäjoki
Heikkilä Hannu, DI	OVAKO Oy, Imatra
Heikkinen Paavo, suunn.pääll.	Kajaani Oy
Hirttiö Kaija	Oulun yliopisto
Hirvensalo Jorma, DI	Oulun Puhelin Oy
Huovila Anja, suunn.	Oulu Oy
Isoherranen Jukka	Outokumpu Oy
Isopoussu Ari	Oulun yliopisto
Jauhiainen Osmo	TKK, Laskentakeskus
Karhela Hannu	Oulun yliopisto
Karjalainen Päivi	Oulun yliopisto
Karjalainen Tapani	Oulun yliopisto
Kellunki Kari	Oulun yliopisto
Kangasluoma Matti	Oulun yliopisto
Kankkunen Tapio, ekon	Oulun Maarakennuspojat Oy, Oulu
Kastemaa Pekka, raaka-a.hankk.	Pohjolan Kaapeli Oy, Oulu
Kauppi Eeva, LuK	Kemira Oy, Oulun tehtaat
Kemilä Hannu	Oulun yliopisto
Kemppainen Pauli, ins	Koillis-Pohjan Sähkö
Keränen Risto	Oulun yliopisto
Kerola Pentti, prof.	Oulun yliopisto
Kinnunen Jorma	Kainuun Valo Oy, Kajaani
Kippo Asko	Oulun yliopisto
Koivisto Hannu	Asteriski ry, Turku
Koivumaa Seppo	Oulun yliopisto
Kukkonen Ilkka	Oulun maanmitt.tsto
Kurikka Ari, suunn.-ohj.	Veitsiluoto Oy, Kemi
Lakarvi Erkki	Kainuun Valo Oy, Kajaani
Laros Juhani, talousjoht.	Oulu Oy
Lavikko Tapio	Oulun yliopisto
Lavila Veli-Pekka	Oulun yliopisto
Lehtinen Leo	Luuppi ry, Tampere
Liimatainen Antti	Oulun yliopisto
Liukas Tero, ins	Salora Oy, Salo
Lohi Risto, ins	Pohjois-Suomen Rakennus Oy, Oulu



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Isoherranen Jukka	Outokumpu Oy
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1.2 Kameraaufnahmen

Das Ergebnis der Layouterkennung sowie der Bestimmung der Vorlesereihenfolge auf stark verzerrten Aufnahmen, ermittelt mit Hilfe des vorgestellten Algorithmus. Die Auswertung wurde analog zur im Abschnitt 1.1 beschriebenen Methode durchgeführt.

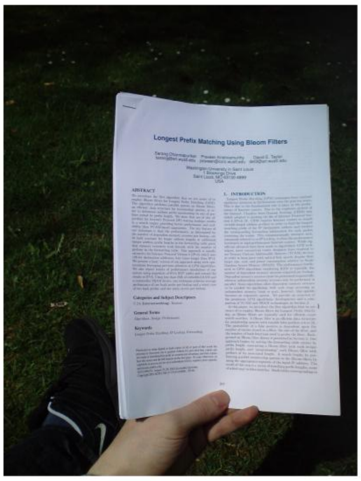
Tabelle 2: Auswertung der Layouterkennung auf den speziell angefertigten Dokumentenaufnahmen.

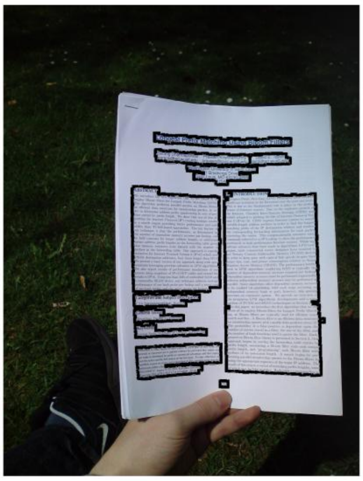
Dokument	**Regionen** Korrekt/Gesamt	**Vorlesereihenfolge** Korrekt/Gesamt
1.	8/12	8/11
2.	6/6	5/5
3.	6/8	5/7
4.	8/8	6/7
5.	10/11	12/12
6.	9/9	8/8
7.	6/7	6/9
8.	7/7	5/6
9.	3/5	4/4
10.	11/13	9/9
11.	8/9	6/7
12.	10/18	7/7
13.	9/9	8/8
14.	6/6	5/5

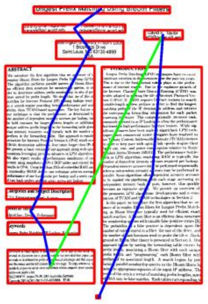
Kameraaufnahmen

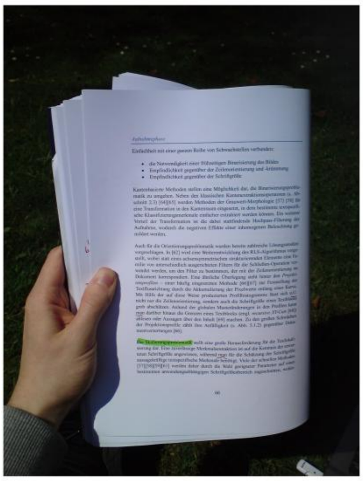
Alle Dokumente	**107/128**	**94/105**

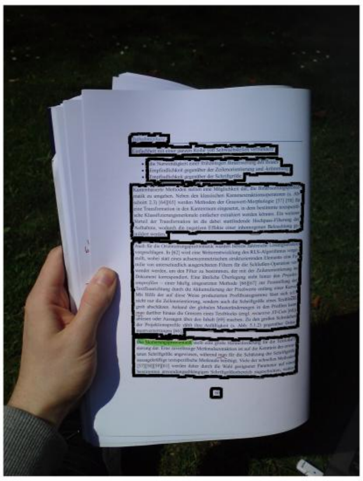
Eingabebild ***Regionsgrenzen*** ***Vorlesereihenfolge***

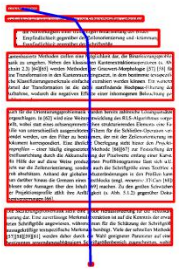


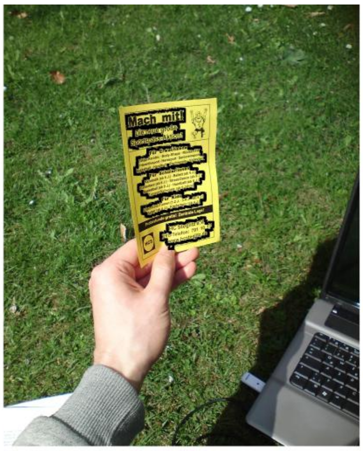


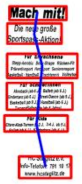


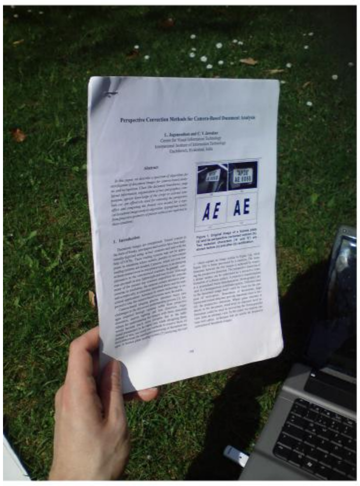


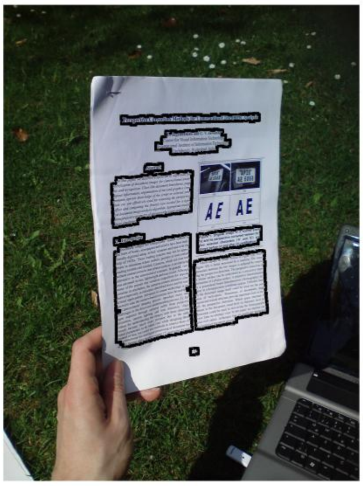


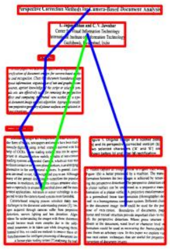


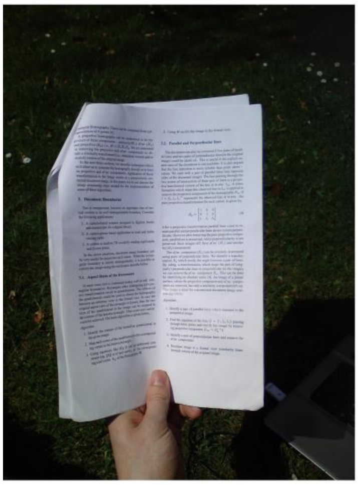


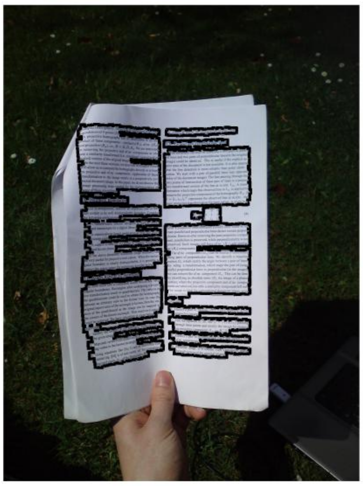


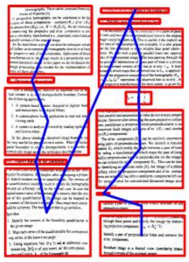


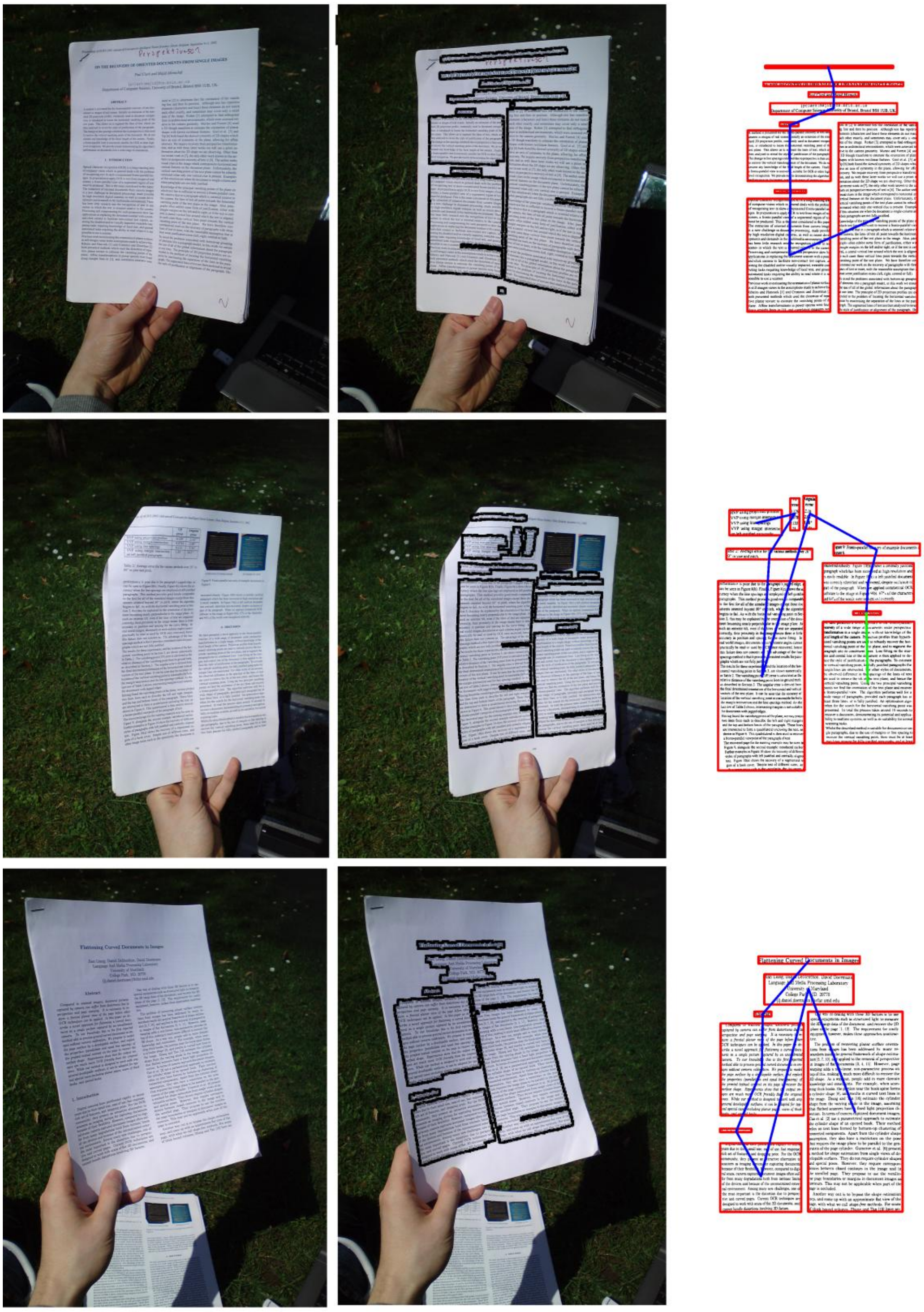


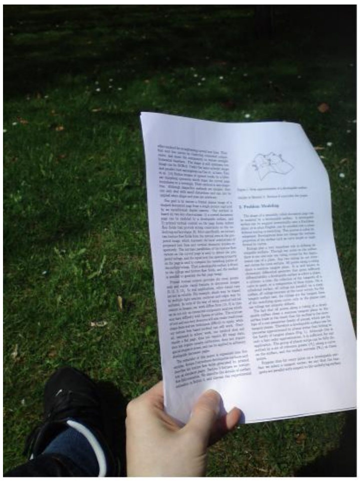


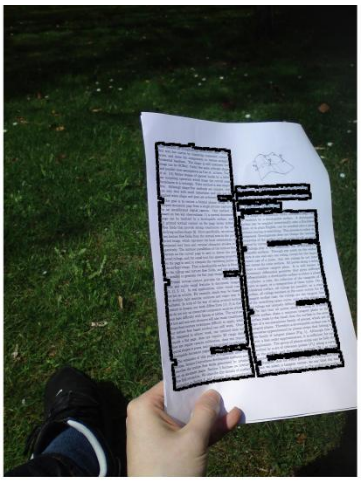


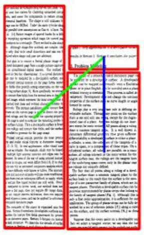


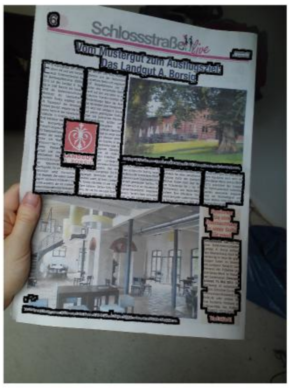


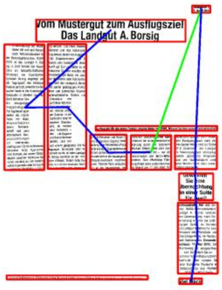


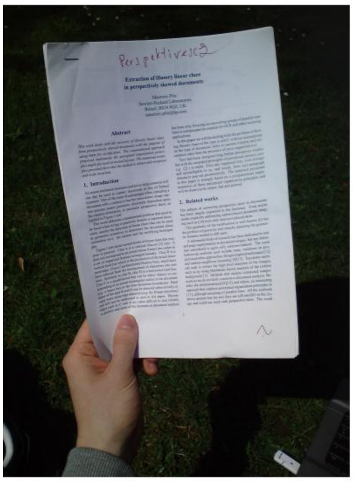


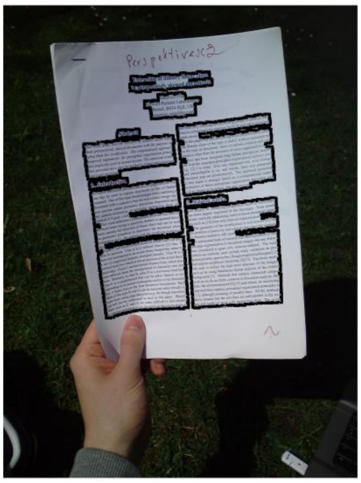


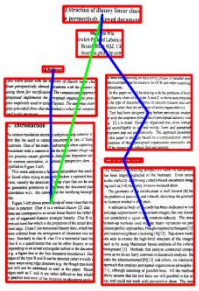




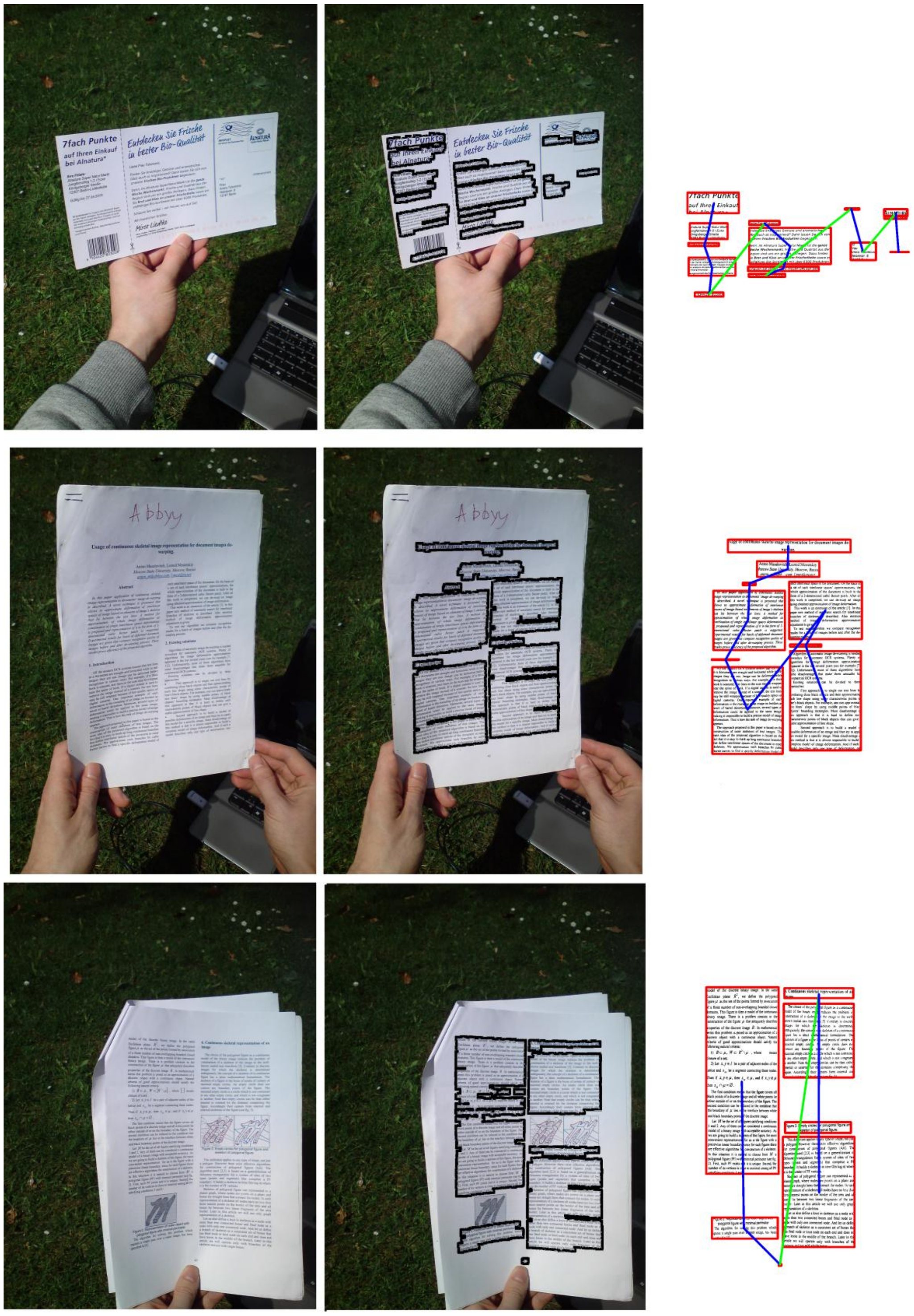








Kameraaufnahmen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