

## Visão Global

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**Visão Global do Projecto****Referência do projecto**

Project reference

PTDC/EIA/67589/2006

**1. Identificação do projecto**

1. Project description

**Financiamento solicitado**

Requested funding

106.738,00 Euros

**Área científica principal**

Main Area

Computer Engineering

No caso de considerar imprescindível a avaliação do seu projecto numa outra área científica proponha qual:

**Área científica Secundária**

Secondary area

*(vazio)**(void)***Título do projecto (em português)**

Project title (in portuguese)

A-CSCW - CSCW Atentivo

**Título do projecto (em inglês)**

Project title (in english)

A-CSCW - Attentive CSCW

**Palavra-chave 1**

Trabalho Cooperativo Suportado em Computador

**Keyword 1**

Computer Supported Cooperative Work

**Palavra-chave 2**

Interfaces Atentivas

**Keyword 2**

Attentive User Interfaces

**Palavra-chave 3**

Atenção em Grupo

**Keyword 3**

Group Attention

**Palavra-chave 4**

n/a

**Keyword 4**

n/a

**Objectivos sócio-económicos**

Socio-economic objectives

Industry - Software development

**Data de início do projecto**

Starting date

01-11-2007

**Duração do projecto em meses**

Duration in months

30

**2. Instituições participantes**

2. Participating institutions

**Instituição Proponente**

Principal Contractor

**Fundação da Faculdade de Ciências (FFC/FC/UL)**

Campo Grande - Edifício C7 -1º Piso

1749-016Lisboa

**Instituições Participantes**

Participating Institutions

**Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa (INESC ID/INESC/IST/UTL)**

Rua Alves Redol, 9  
1000-029Lisboa

**Unidade de Investigação**

Principal Research Unit

**Laboratório de Sistemas Informáticos de Grande Escala (LASIGE/FC/UL)**

Bloco C5, Piso 1, Campo Grande  
1749-016Lisboa

**Instituição de Acolhimento**

Host Institution

**Faculdade de Ciências da Universidade de Lisboa (FC/UL)**

Campo Grande - Edifício C5  
1700-000Lisboa

**3. Orçamento da Candidatura**

3. Proposal Budget

-

**Instituição Proponente**

Principal Contractor

**Fundação da Faculdade de Ciências**

DESCRIÇÃO

DESCRIPTION	2007	2008	2009	2010	2011	TOTAL
Recursos Humanos Human resources	4985	9969	4985	0	0	19939
Missões Missions	4000	6000	4000	0	0	14000
Consultores Consultants	0	0	0	0	0	0
Aquisição de serviços e manutenção Acquisition of services and maintenance	0	0	0	0	0	0
Outras despesas correntes Other current expenses	1500	1500	1500	0	0	4500
Despesas gerais Overheads	3511	3494	2097	0	0	9102
Equipamento Equipment	7070	0	0	0	0	7070
<b>TOTAL</b>	<b>21066</b>	<b>20963</b>	<b>12582</b>	<b>0</b>	<b>0</b>	<b>54611</b>

**Instituições Participantes**

Participating Institutions

**Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa**

DESCRIÇÃO

DESCRIPTION	2007	2008	2009	2010	2011	TOTAL
Recursos Humanos Human resources	4985	9969	4985	0	0	19939
Missões Missions	4000	6000	4000	0	0	14000
Consultores Consultants	0	0	0	0	0	0
Aquisição de serviços e manutenção Acquisition of services and maintenance	0	0	0	0	0	0
Outras despesas correntes Other current expenses	1000	1000	1000	0	0	3000
Despesas gerais Overheads	3297	3394	1997	0	0	8688
Equipamento Equipment	6500	0	0	0	0	6500
<b>TOTAL</b>	<b>19782</b>	<b>20363</b>	<b>11982</b>	<b>0</b>	<b>0</b>	<b>52127</b>

**Orçamento Global**

Global budget

DESCRIÇÃO

DESCRIPTION	2007	2008	2009	2010	2011	TOTAL
Recursos Humanos Human resources	9970	19938	9970	0	0	39878

Missões	8000	12000	8000	0	0	28000
Missions						
Consultores	0	0	0	0	0	0
Consultants						
Aquisição de serviços e manutenção	0	0	0	0	0	0
Acquisition of services and maintenance						
Outras despesas correntes	2500	2500	2500	0	0	7500
Other current expenses						
Despesas gerais	6808	6888	4094	0	0	17790
Overheads						
Equipamento	13570	0	0	0	0	13570
Equipment						
<b>TOTAL</b>	<b>40848</b>	<b>41326</b>	<b>24564</b>	<b>0</b>	<b>0</b>	<b>106738</b>

**Plano de financiamento****Finance plan**

DESCRIÇÃO	2007	2008	2009	2010	2011	TOTAL
DESCRIÇÃO						
Financiamento solicitado à FCT	40848	41326	24564	0	0	106738
Requested funding						
Financiamento próprio	0	0	0	0	0	0
Own funding						
Outro financiamento público	0	0	0	0	0	0
Other public-sector funding						
Outro financiamento privado	0	0	0	0	0	0
Other private funding						
<b>Total do Projecto</b>	<b>40848</b>	<b>41326</b>	<b>24564</b>	<b>0</b>	<b>0</b>	<b>106738</b>
<b>Total of the project</b>						

**3.1 Orçamento do Projecto**

## 3.1 Budget

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**Instituição Proponente****Principal Contractor****Fundação da Faculdade de Ciências**

DESCRIÇÃO	2007	2008	2009	2010	2011	TOTAL
DESCRIÇÃO						
Recursos Humanos		0 2991	9969	1994	0	14954
Human resources						
Missões		0 5750	5000	1000	0	11750
Missions						
Consultores		0 0	0	0	0	0
Consultants						
Aquisição de serviços e manutenção		0 0	0	0	0	0
Acquisition of services and maintenance						
Outras despesas correntes		10 500	400	100	0	1010
Other current expenses						
Despesas gerais		400 2648	3074	619	0	6741
Overheads						
Equipamento		2000 4000	0	0	0	6000
Equipment						
<b>TOTAL</b>	<b>2410</b>	<b>15889</b>	<b>18443</b>	<b>33713</b>	<b>0</b>	<b>040455</b>

**Instituições Participantes****Participating Institutions****Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa**

DESCRIÇÃO	2007	2008	2009	2010	2011	TOTAL
DESCRIÇÃO						
Recursos Humanos	0	2991	9969	1994	0	14954
Human resources						
Missões	0	5000	5000	1000	0	11000
Missions						
Consultores	0	0	0	0	0	0
Consultants						
Aquisição de serviços e manutenção	0	0	0	0	0	0
Acquisition of services and maintenance						

Outras despesas correntes Other current expenses	100	400	400	100	0	1000
Despesas gerais Overheads	20	2878	3074	619	0	6591
Equipamento Equipment	0	6000	0	0	0	6000
<b>TOTAL</b>	<b>120</b>	<b>17269</b>	<b>18443</b>	<b>3713</b>	<b>0</b>	<b>39545</b>

**Orçamento Global****Global budget**

## DESCRICÃO

DESCRIPTION	2007	2008	2009	2010	2011	TOTAL
Recursos Humanos Human resources	0	5982	19938	3988	0	29908
Missões Missions	0	10750	10000	2000	0	22750
Consultores Consultants	0	0	0	0	0	0
Aquisição de serviços e manutenção Acquisition of services and maintenance	0	0	0	0	0	0
Outras despesas correntes Other current expenses	110	900	800	200	0	2010
Despesas gerais Overheads	420	5526	6148	1238	0	13332
Equipamento Equipment	2000	10000	0	0	0	12000
<b>TOTAL</b>	<b>2530</b>	<b>33158</b>	<b>36886</b>	<b>7426</b>	<b>0</b>	<b>80000</b>

**Plano de financiamento****Finance plan**

## DESCRICÃO

DESCRIPTION	2007	2008	2009	2010	2011	TOTAL
Financiamento solicitado à FCT Requested funding	2530	33158	36886	7426	0	80000
Financiamento próprio Own funding	0	0	0	0	0	0
Outro financiamento público Other public-sector funding	0	0	0	0	0	0
Outro financiamento privado Other private funding	0	0	0	0	0	0
<b>Total do Projecto</b> <b>Total of the project</b>	<b>2530</b>	<b>33158</b>	<b>36886</b>	<b>7426</b>	<b>0</b>	<b>80000</b>

## 4. Justificação do orçamento

## 4. Budget justification

-

**4.1. Justificação dos recursos humanos****4.1. Human resources justification**

Tipo	Nº de pessoas	Duração	Custo envolvido (€)
(BI) Bolsa de Investigação (Lic. ou Bacharel)	4	12	35760

## Justificação

Each partner will use one BI to work on task T2 (prototyping attentive devices) and one BI to work on task T5 (conducting the evaluations).

**Custo total: 35760****4.2. Justificação de missões****4.2. Mission justification**

Tipo	Local	Nº de deslocações	Custo envolvido (€)
Participação em congressos	Europe/US	14	28000

## Justificação

Seven missions are expected per partner (at a unitary cost of 2000 Euros) for the project duration. These missions will support the dissemination of the project results in significant international conferences.

**Custo total: 28000****4.3. Justificação de consultores****4.3. Consultants justification***(vazio)**(void)*

**4.4. Justificação de aquisição de serviços e manutenção****4.4. Acquisition of services and maintenance justification***(vazio)**(void)***4.5. Justificação de outras despesas correntes****4.5. Current expenses justification**

Tipo de despesa	Custo envolvido (€)
Bibliography, other	7500
Justificação	

The proposed costs per partner are residual: 1000 Euros per year (except the coordinator, with additional 500 Euros). Most of these expenses cover the acquisition of bibliography, express mail, etc.

**Custo total: 7500****4.6. Justificação do Equipamento****4.6. Equipment justification****4.6.1. Equipamento já disponível para a execução do projecto****4.6.1 Available equipment**

Tipo de equipamento	Fabricante	Modelo	Ano
4 x 3D tracker	Intersense	Intertrax2	2006
Neural interface	Nolan Systems	Mind Set MS-1000	2005

**4.6.2. Discriminação do equipamento a adquirir****4.6.2. List of new equipment requested**

Tipo de equipamento	Fabricante	Modelo	Custo envolvido (€)
4 x Video Camera	JVC	JVC GZ-MG20, 20G	2320
Justificação			

Four video cameras are necessary to capture in video the participants interactions during the experiments. One camera will be located in each corner of the laboratory, so that all participants may be monitored.

Usability testing software	Noldus	Observer XT 6.1	2500
Justificação			

This usability testing software supports the instrumentation and subsequent analysis of the experimental data. This software allows marking, coding and analyzing the multiple video streams captured during the experiments.

Eye tracker	Arrington Research	Monocular Total QuickClamp	6500
Justificação			

The eye tracker supports collecting fine-grained data about eye movements, eye blinking, and pupil dilatation. Eye trackers have been used in several experiments to determine the user's visual focus of attention; additionally, eye blinking and pupil dilatation data provide physiological measures of mental workload that may help in determining opportune moments to interrupt the user.

Heart rate sensors	Suunto	Team Pack Pro 1	2250
Justificação			

This equipment allows real-time measuring of heart rates for up to 10 team members simultaneously. Heart rate variability has been used in several experiments to measure mental workload and may help in determining opportune moments to interrupt the users.

**Custo total: 13570****5. Equipa de investigação****5. Research team**

-

**5.1 Lista de membros (6)****5.1. Members list (6)**

Nome	Função	Grau académico	%tempo
Name	Role	Academic degree	%time
<a href="#">Pedro Alexandre de Mourão Antunes</a>	Inv. Responsável	DOUTORAMENTO	25
<a href="#">Luis Manuel Pinto da Rocha Afonso Carriço</a>	Investigador	DOUTORAMENTO	5
<a href="#">Manuel João Caneira Monteiro da Fonseca</a>	Investigador	DOUTORAMENTO	15
<a href="#">Marco Abelha César de Sá</a>	Investigador	MESTRADO	10
<a href="#">António Manuel Silva Ferreira</a>	Investigador	MESTRADO	100
<a href="#">Ricardo Jorge Jota Costa</a>	Investigador	MESTRADO	50

*(O curriculum vitae de cada membro da equipa está disponível clicando no nome correspondente)*

*(Curriculum vitae for each research team member is available by clicking on the corresponding name)*

**5.2. Lista de membros a contratar durante a execução do projecto (4)**

5.2. Members list to hire during project's execution (4)

Membro da equipa	Função	Duração	%tempo
Team member	Role	Duration	%time
(BI) Bolseiro de Investigação (Lic. ou Bacharel) 1	Bolseiro	12	100
(BI) Bolseiro de Investigação (Lic. ou Bacharel) 2	Bolseiro	12	100
(BI) Bolseiro de Investigação (Lic. ou Bacharel) 3	Bolseiro	12	100
(BI) Bolseiro de Investigação (Lic. ou Bacharel) 4	Bolseiro	12	100

**6. Projectos financiados**

6. Funded projects

**Lista de projectos financiados (2)**

Funded projects list (2)

Referência	Título	Estado
<a href="#">POSC/EIA/59938/2004</a>	Decoração Aumentada: Combinando Realidade Aumentada e Recuperação de Objectos 3D para a Decoração de Interiores	Em curso
<a href="#">POSC/EIA/57038/2004</a>	E-Voto - Uma Nova Arquitectura para Lidar com o Risco em Sistemas de E-Voto	Em curso

*(Os detalhes de cada projectos estão disponíveis clicando na referência correspondente)**(Details for each project are available by clicking on the corresponding reference.)***7. Indicadores previstos**

7. Expected indicators

**Indicadores de realização previstos para o projecto**

Expected output indicators

DESCRIÇÃO	2007	2008	2009	2010	2011	Total
DESCRIPTION						
<b>A - Publicações</b>						
<b>Publications</b>						
Livros						
Books	0	0	0	0	0	0
Artigos em revistas internacionais						
Papers in international journals	0	1	1	0	0	2
Artigos em revistas nacionais						
Papers in national journals	0	0	1	0	0	1
<b>B - Comunicações</b>						
<b>Communications</b>						
Comunicações em encontros científicos internacionais						
Communications in international meetings	4	6	4	0	0	14
Comunicações em encontros científicos nacionais						
Communications in national meetings	1	1	1	0	0	3
<b>C - Relatórios</b>						
<b>Reports</b>						
Relatórios	3	3	3	0	0	9
<b>D - Organização de seminários e conferências</b>						
<b>Organization of seminars and conferences</b>						
Organização de seminários e conferências	0	1	1	0	0	2
<b>E - Formação avançada</b>						
<b>Advanced training</b>						
Teses de Doutoramento						
PhD theses	0	1	0	0	0	1
Teses de Mestrado						
Master theses	0	1	0	0	0	1
Outras						
Others	0	0	0	0	0	0
<b>F - Modelos</b>						
<b>Models</b>						
Modelos	1	0	0	0	0	1
<b>G - Aplicações computacionais</b>						
<b>Software</b>						
Aplicações computacionais	4	2	2	0	0	8
<b>H - Instalações piloto</b>						
<b>Pilot plants</b>						
Instalações piloto	1	1	1	0	0	3
<b>I - Protótipos laboratoriais</b>						
<b>Prototypes</b>						
Protótipos laboratoriais	1	1	1	0	0	3
<b>J - Patentes</b>						
<b>Patents</b>						
Patentes	0	0	0	0	0	0
<b>L - Outros</b>						
<b>Other</b>						
Outros	0	0	0	0	0	0
	0	0	0	0	0	0

0 0 0 0 0 0

**Ações de divulgação da actividade científica****Scientific activity spreading actions**

*(Estimula-se a apresentação e propostas neste âmbito que possibilitem a aproximação da actividade científica ao grande público)*

*(It is strongly desired the presentation of proposals within this subject that will approach science to the general public.)*

Special tracks on Attentive User Interfaces will be organized in conjunction with the two major Portuguese conferences in the area (INTERACÇÃO, EPCG). These conferences have participation from industry, thus allowing to disseminate the project results to industry.

Furthermore, all information related to the project will be publicly available in a Web site, including

papers, reports, prototypes, demos, and source code.

**8. Anexo técnico**

8. Technical addendum

**8.1. Resumo****8.1. Abstract****Resumo (em português)****Abstract (in portuguese)**

Ao longo dos anos 90 vários investigadores da área da Interação Pessoa-Máquina (HCI em inglês) mostraram interesse nas Interfaces com o Utilizador Atentivas (Attentive User Interfaces ou AUI). Uma motivação principal para as AUI é o reconhecimento que o aumento da necessidade de informação é acompanhado pelo aumento dos custos de estar desatento ou de ser interrompido. Assim, em vez de assumirem que os utilizadores estão sempre focados na tarefa a desempenhar, as AUI permitem que os utilizadores negoceiem a sua atenção sobre a tarefa e ao mesmo tempo gerem os fluxos de informação tendo em conta o estado de atenção do utilizador. <br><br>Quase toda a investigação sobre AUI está direccionada para actividades com um só utilizador e assume que o desempenho individual é afectado negativamente pelo número de pedidos simultâneos de atenção. As experiências nesta área tipicamente estudam os efeitos numa tarefa primária causados por interrupções que requerem o processamento de uma tarefa secundária, possivelmente não relacionada e inesperada. Os investigadores que seguem esta linha de investigação procuram, actualmente, formas de melhorar os dispositivos de entrada e saída para que o utilizador permaneça focado na tarefa principal sem se distraírem demasiado com a tarefa secundária. <br><br>O estudo da atenção no contexto colaborativo com múltiplos utilizadores é uma área de investigação largamente inexplorada. Neste contexto tem de ser equacionado o problema da atenção em grupo: à medida que a necessidade de colaboração aumenta também aumentam os custos da desatenção e das interrupções provocadas pelos outros membros do grupo. <br><br>Enquanto as tendências actuais de investigação na área de Trabalho Colaborativo Suportado em Computador (CSCW em inglês) procuram disponibilizar mais, mas não necessariamente melhor, informação sobre o grupo, negligenciando o problema da atenção em grupo, nós sugerimos um caminho que reconheça explicitamente as limitações da capacidade de processamento de informação dos humanos, e portanto também dos grupos. <br><br>Este caminho é consistente com a investigação em AUI e nós argumentamos que o corpo de conhecimento actual pode ser estendido à área de CSCW. Esta assumpção é baseada em estudos que realizámos anteriormente dos quais resultou uma plataforma preliminar para a atenção em grupo, específica para CSCW. <br><br>O objectivo fundamental deste projecto é ir para além dos estudos preliminares, em direcção a uma teoria sobre a atenção em grupo. Este objectivo ambicioso será sustentado por duas etapas de investigação: <br><br>1) Prototipagem de dispositivos de atenção especializados; e <br><br>2) Uso desses dispositivos em experiências de laboratório para perceber o papel da atenção em grupo em CSCW. <br><br>Estas duas etapas serão suportadas pelas tarefas seguintes: <br><br>- A tarefa 1 (T1) desenvolve a plataforma para compreender a atenção em grupo; <br><br>- A T2 cria protótipos de dispositivos de atenção com base na plataforma de atenção em grupo; <br><br>- O objectivo das tarefas T3 e T4 é planejar e montar experiências de laboratório incidindo sobre os níveis de grupo e individual (cognitivo); <br><br>- A T5 tem como propósito executar a experiências; <br><br>- O objectivo da T6 é lançar as fundações para um modelo de desempenho em grupo, em antecipação de investigação futura; <br><br>- As tarefas T7 e T8 incidem sobre a disseminação de resultados e sobre a gestão do projecto. <br><br>A principal contribuição deste projecto é a convergência entre as AUI e o CSCW, da qual podem resultar novas perspectivas sobre como as pessoas gerem a atenção em grupo. Adicionalmente, os dispositivos especializados em detectar e melhorar a atenção em grupo também representam uma importante contribuição para o estado da arte.

**Resumo (em inglês)****Abstract (in english)**

During the late 1990's several researchers from the Human-Computer Interaction (HCI) field became interested in Attentive User Interfaces (AUI). A prime motivation for AUI is the recognition that, as the needs for information rise, so do the costs of not paying attention and being interrupted. Therefore, instead of assuming the users are always focused on the task, AUI allow users to negotiate their degree of attention to the task, and at the same time manage the

information flows taking into consideration the attention status. Most AUI research is directed towards single-user activity and assumes that individual performance degrades with the number of simultaneous requests for attention. Experiments in this area typically study the effects on a primary task caused by interruptions that require processing of a secondary task, possibly unrelated and unexpected. In this research line, researchers are enhancing both input and output devices so that the user remains focused on the primary task without getting too much distracted by the secondary task. The study of attention in the multi-user collaborative context is largely an unexplored research area. In this context, we must equate the group attention problem: as the needs for collaboration rise so do the costs of not paying attention and being interrupted by the others. While current research trends in Computer Supported Collaborative Work (CSCW) aim at conveying more, but not necessarily better, information about the group, neglecting the group attention problem, we suggest a route that explicitly recognizes the limitations of the human, and therefore the group, information-processing capacity. This route is consistent with AUI research and we argue that the existing body of knowledge can be extended into the CSCW field. This assumption is based on our prior research, which lead to a preliminary group attention framework specific for CSCW. The fundamental objective of this project is to move beyond our preliminary research inquiries and towards a sound theory about group attention. This ambitious goal will be pursued in two major steps: 1) Prototype several specialized attentive devices; and 2) Use these devices in laboratory experiments to understand the role of group attention in CSCW. These two steps will be supported by the following set of concrete tasks: Task 1 develops the framework to understand group attention; Task 2 builds upon the framework to develop the attentive devices; Task 3 and 4 is to prepare the laboratory experiments at the group and cognitive levels; Task 5 is to formally conduct the experiments; Task 6 is to lay foundations on a group performance model, in anticipation of future research; Tasks 7 and 8 are dissemination of results, and project coordination and management. The major contribution of this research is the convergence between AUI and CSCW, giving insights on how group participants manage group attention. Furthermore, the specialized attentive devices for sensing and enhancing group attention also represent an important contribution to the state-of-the-art.

### *8.2. Objectivos*

#### *8.2. Objectives*

#### **Descrição dos Objectivos do Projecto**

##### **Project Objectives (description)**

The main objective of this project is to study how technology may positively influence group attention in the collaborative context. This objective will be accomplished by researching the following questions:

- How collaborating individuals divide their attention between the group and the individual tasks?
- How can technology positively influence the attention to the group?
- Which computer devices improve group attention?
- What are the guidelines to incorporate such devices in future CSCW systems?
- What are the expected performance improvements?

Answers to these questions will be supplied to the research community via:

- A theoretical framework for group attention;
- A collection of attentive devices that can be integrated in CSCW systems and tools;
- Results from laboratory experiments with attentive devices;
- A group performance model based on attention;
- A collection of best practices for designing attentive CSCW.

#### **Descrição dos Objectivos do Investigador Responsável**

##### **Principal Investigator Objectives (description)**

The Principal Investigator has been doing research in the CSCW field for the last 15 years, focusing in particular on the analysis and design of complex socio-technical interactions, such as electronic meetings and group decision-making and negotiation. These systems are intimately related with interdependence, collaboration, and situation awareness; as well as attention. Since attention is a very scarce resource, this project will try to understand and explain how technology may support such a fundamental resource in the collaborative context.

### *8.3. Estado da Arte*

#### *8.3. State of the Art*



**Descrição do Estado da Arte****State of the Art (description)**

The study of the mediating role of computers on group attention is largely an unexplored research area. First, research in the cognitive psychology field considers computers as neutral tools that can be safely used in laboratory experiments. In addition, these experiments are usually limited to one subject at a time and the stimuli are controlled by the researchers (the focus is on bottom-up sensory attention) (Eysenck and Keane, 2000). There is a lack of studies concerning multiple subjects working as a group and using computers, where the computers themselves may influence human attention and where sensory attention may be guided by internal motivational states (stimulated by top-down processes).

Second, in the HCI field most current AUI (Attentive User Interfaces) research is directed towards single-user activity, the main assumption being that individual performance degrades with the number of simultaneous requests for attention. Experiments in this area typically study the effects on a primary task caused by interruptions that require processing of a secondary task (Bailey and Konstan, 2006; Fogarty et al., 2005a). Based on these postulates, researchers are enhancing both input and output devices so that the user remains focused on the primary task without getting too much distracted by the secondary task. This is presently accomplished by several means, such as:

- Sensors that detect the user's state of attention, e.g., via speech (Hudson et al., 2003), eye-gaze, or body orientation (Vertegaal, 2003a; Fogarty et al., 2005b);
- Physiological sensors that assess the user's mental workload, e.g., via heart rate variation, pupil dilatation, or eye-blink (Iqbal et al., 2005; Rowe et al., 1998);
- Statistical models of human interruptibility that determine the best time to communicate with the user (Horvitz et al., 2003; Fogarty et al., 2005a);
- Computer displays that present information at various levels of detail, depending on the user's current focus of attention (Baudisch et al., 2003).

We see several challenges in incorporating single-user AUI in CSCW due especially to these typical characteristics of CSCW:

- People involved in group work attend to interruptions much more often than individuals. This is directly linked with the need to maintain group awareness and with the greater number of information flows;
- Collaborative work is more fragmented than individual work, i.e., instead of executing a single, extensive task, group members tend to perform a series of intertwined tasks, one at a time. This work strategy improves group awareness and enables faster recovery from errors;
- In group work the primary and secondary tasks are typically related and can both contribute to the shared goal.

We addressed these CSCW characteristics in a preliminary group attention framework (Ferreira and Antunes, 2006b, 2006c) and in a study about information flows and specializations of physical interface devices for CSCW systems (Antunes et al., 2006). Our main guidelines were:

- The conventional information flows between the user and the computer should considerably change to reflect collaborative actions, mutual awareness, and interdependence;
- The focus and granularity should significantly change to reflect the interactions between users, mediated by the CSCW system.

Third, existing research on applying AUI to CSCW is very rare and has been situated in video conferencing, e.g., an experiment where cameras and eye-tracking sensors were used to prolong the perception of eye contact between group members to improve turn-taking, especially in situations where no one is speaking (Vertegaal et al., 2003b). This application of AUI to CSCW is tied to synchronous interaction and relies on video signals, both of which may be unsuitable for use in many CSCW systems. Our preliminary approach makes no assumption regarding time or place (Ferreira and Antunes, 2006b, 2006c).

**References**

- Antunes, P., Ferreira, A., Pino, J. Analyzing shared workspaces design with human-performance models. Accepted for publication in: Proc. of the twelfth int. workshop on Groupware. 2006
- Bailey, B., Konstan, J. On the need for attention-aware systems: Measuring effects of interruption on task performance, error rate, and affective state. Computers in Human Behavior

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Ferreira, A., Antunes, P. Dispositivos de gestão da atenção em sistemas colaborativos. Accepted for publication in *Interação '06: Actas da segunda conf. nacional em Interação Pessoa-Máquina*. 2006b

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Horvitz, E., Kadie, C., Paek, T., Hovel, D. Models of attention in computing and communication: From principles to applications. *Commun. of the ACM* 46(3). 2003. 52-59

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Iqbal, S., Adamczyk, P., Zheng, X., Bailey, B. Towards an index of opportunity: Understanding changes in mental workload during task execution. *Proc. of the SIGCHI conf. on Human factors in computing systems*. 2005. 311-320

Rowe, D., Sibert, J., Irwin, D. Heart rate variability: Indicator of user state as an aid to human-computer interaction. *Proc. of the SIGCHI conf. on human factors in computing systems*. 1998. 480-487

Vertegaal, R. Attentive user interfaces. *Commun. of the ACM* 46(3). 2003a, 30-33

Vertegaal, R., Weevers, I., Sohn, C., Cheung, C. GAZE-2: Conveying eye contact in group video conferencing using eye-controlled camera direction. *Proc. of the SIGCHI conf. on Human factors in computing systems*. 2003b. 521-528

#### **8.4. Resultados e Repercussões**

#### **8.4. Results and Repercussions**

##### **Divulgação de Resultados (descrição)**

##### **Diffusion of Results (description)**

The results from this project will be made publicly available via:

- Publications in ISI journals;
- Publications in major international and national conferences;
- Demonstrations and prototypes on the Internet;
- Program source code and technical documentation on the Internet.

##### **Repercussões (descrição)**

##### **Repercussions (description)**

As demonstrated by the state-of-the-art research, the CSCW field has in general neglected the group attention problem. Our own explanation to this situation, which is corroborated by many anonymous comments received from reviewers, is that the CSCW field has concentrated most research efforts in collaborative activities in two major time scales: from minutes to hours (focusing on tasks and coordination), and from hours to days (addressing the social aspects). A much shorter time scale has been neglected: from seconds to minutes (focusing on cognitive aspects). By addressing the shorter time scale, this project pushes the CSCW field towards understanding in finer details how individuals organize their attention between themselves and the others during group work.

#### **8.5. Regionalização**

#### **8.5. Regionalization**

Região	Porcentagem
Region	Percent

Norte	15
Centro	14
Lisboa e Vale do Tejo	15
Alentejo	14
Algarve	14
Região Autónoma dos Açores	14
Região Autónoma da Madeira	14

#### Descrição

#### Description

The industrial repercussions of this project are not expected to show significant regional differences.

### 8.6. Tarefas

#### 8.6. Tasks

#### Lista de tarefas (8)

#### Task list (8)

Designação da tarefa	Data de início	Data de fim	Pessoas * mês
Task denomination	Start date	End date	Person * months
<a href="#">T1 - Group attention framework</a>	01-01-2007	30-06-2009	6
<a href="#">T8 - Coordination and management</a>	01-01-2007	30-06-2009	4
<a href="#">T2 - Attentive devices</a>	01-04-2007	30-06-2008	30
<a href="#">T7 - Dissemination</a>	01-07-2007	30-06-2009	12
<a href="#">T3 - Group-level experimental setup</a>	01-10-2007	30-04-2008	3
<a href="#">T4 - Cognitive-level experimental setup</a>	01-10-2007	30-04-2008	3
<a href="#">T5 - Evaluation</a>	01-01-2008	31-03-2009	30
<a href="#">T6 - Group performance model</a>	01-01-2009	30-06-2009	6

(Os detalhes de cada tarefa estão disponíveis clicando na designação correspondente)

(Details for each task are available by clicking on the corresponding denomination)

### 8.7. Referências Bibliográficas

#### 8.7. Bibliographic references

#### Ano Publicação

#### Year Publication

2005 Antunes, P., Ramires, J., Respício, A. (forthcoming). Addressing the conflicting dimension of groupware: A case study in software requirements validation. Computing and Informatics

2006 Antunes, P., Ferreira, A., Pino, J. Analyzing shared workspaces design with human-performance models. Accepted for publication in: Proc. of the twelfth int. workshop on Groupware. 2006

2006 Ferreira, A., Antunes, P. Quantitative evaluation of workspace collaboration. Proc. of the tenth int. conf. on Computer supported cooperative work in design. 2006. 1065-1070

2006 Ferreira, A., Antunes, P. Dispositivos de gestão da atenção em sistemas colaborativos. Accepted for publication in Interação '06: Actas da segunda conf. nacional em Interação Pessoa-Máquina. 2006

2006 Antunes, P., Borges, M., Pino, J., Carriço, L. Analytic evaluation of groupware design. Lecture Notes in Computer Science 3865. 2006. 31-40

### 8.8. Artigos Anteriores

#### 8.8. Previous Articles

#### Ano Artigo (endereço na Internet - URL)

#### Year Paper (Link in the Internet - URL)

2005 <http://www.di.fc.ul.pt/~paa/papers/cai-05.pdf>

2006 <http://www.di.fc.ul.pt/~paa/papers/criwg-06-analytic.pdf>

2006 <http://www.di.fc.ul.pt/~asfe/publications/cscwid-06.pdf>

2006 <http://www.di.fc.ul.pt/~asfe/publications/inter-06.pdf>

2006 <http://www.di.fc.ul.pt/~paa/papers/cscwid-Incs-06.pdf>

### 9. Ficheiros Anexos

#### 9. Attachments

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

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Luis Manuel Pinto da Rocha Afonso Carriço (Investigador)

Manuel João Caneira Monteiro da Fonseca (Investigador)

António Manuel Silva Ferreira (Investigador)

Ricardo Jorge Jota Costa (Investigador)

#### Descrição da tarefa

Task decription

Designação da tarefa

Task denomination

T1 - Group attention framework

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-01-2007

30-06-2009

30

6

Resultados esperados

Expected results

- Group attention framework

This artifact, which will be permanently redefined and validated throughout the project, is fundamental to introduce the attention perspective in the CSCW field. In a perspective more related with the research methodology, this artifact is also mandatory to focus and bound the research.

Descrição da tarefa

Task description

- Update the literature review

The existing literature review on human attention phenomena will be expanded and analyzed in more detail.

- Define a group attention framework

The starting point for understanding group attention is to acknowledge that humans, and therefore groups, have limited information processing capacity. This limitation is particularly relevant in scenarios where groups need to reach a common goal and computers are necessary to mediate communication between group members.

The major goal set for this task is to clearly identify, characterize and delimit the phenomena of interest: the aspects of collaboration that group members attend to during group work. Our strategy is to reuse and generalize our prior research on the use of shared workspaces that characterized group attention in terms of three basic information flows: explicit communication, feedthrough, and back-channel feedback (Antunes et al., 2006).

Explicit communication addresses information flows produced by a group member and explicitly aimed at other members. Feedthrough concerns implicit information delivered to several group members reporting actions executed by one member. Feedthrough is fundamental to support group awareness and construct meaningful contexts for collaboration. Back-channel feedback concerns unintentional information initiated by one group member and directed towards another member, indicating, in particular, that the recipient is following the sender. Apparently, no significant content is delivered through back-channel feedback, since it does not reflect cogitation from the user. However, from the AUI perspective, back-channel feedback is very important because it allows the interface to sense and adapt to human states of attention.

Our perspective is that the group attention framework should be generic, covering a wide variety of CSCW scenarios, applications, and work modes.

References

Antunes, P., Ferreira, A., Pino, J. Analyzing shared workspaces design with human-performance models. Accepted for publication in: Proc. of the twelfth int. workshop on Groupware. 2006

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

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#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T2 - Attentive devices

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-04-2007

30-06-2008

15

30

Resultados esperados

Expected results

We plan to develop prototypes of a minimum of four attentive devices for generic usage in CSCW applications: a time separator, an opportunity seeker, a change emphasize, and an activity anticipator. However, other candidate attentive devices may also be developed and validated during the project, based on the needs identified during Task 1.

Descrição da tarefa

Task description

This task is dedicated to prototype several devices to manipulate group attention, with the objective to enhance the attentive capacity of group members. Based on the group attention framework from the previous task we classify the attentive devices in two major categories: awareness and coupling devices.

Awareness devices are dedicated to sense and display information about the collaborative activity within the group. This involves capturing and conveying adequate representations of explicit communication, feedthrough, and back-channel feedback.

The coupling devices allow group members to control the link between executed actions and awareness. We consider two types of coupling control: at the origin, to specify what and when information should become public; and at the destination, by specifying filters that restrict individual awareness to some objects and actions.

Current coupling devices require manual control of awareness information delivery, thus penalizing individual performance. On the other hand, the capacity to limit the amount of information and number of interruptions may improve group attention. This tradeoff sets the stage for the specialized attentive devices in this task.

The attentional devices currently selected are:

Time separator: delivers awareness information to the users' displays after a predefined constant amount of time has elapsed. The purpose is twofold: to attenuate the effects of "attentional blink" (Eyesenk and Keane, 2000); and to improve task switching performance (Roda and Thomas, 2006).

Opportunity seeker: determines the most adequate time to deliver information to the users according to the users' attentive states. The objective is to seek opportunities that minimize distraction due to interruptions, e.g., at the boundary between consecutive tasks where it is believed that mental workload is lower (Bailey and Konstan, 2006).

Change emphasize: highlights changes that occurred since the previous delivery of information to the user's displays. The purpose is to attenuate the effects of "change blindness," a condition that requires the user to attend to the full awareness picture, causing a significant reduction in performance (Hillstrom and Chai, 2006).

Activity anticipator: senses activity that may affect group performance and delivers preliminary information to the user's displays. The objective is to prepare group members to be attentive to upcoming collaborative outcomes, possibly enabling faster response times.

#### References

Bailey, B., Konstan, J. On the need for attention-aware systems: Measuring effects of interruption on task performance, error rate, and affective state. *Computers in Human Behavior* 22(4). 2006. 685-708

Eysenck, M., Keane, M. In: *Cognitive psychology: A student's handbook*. Psychology Press. 2000. 119-150

Hillstrom, A., Chai, Y. Factors that guide or disrupt attentive visual processing. *Computers in Human Behavior* 22(4). 2006. 648-656

Roda, C., Thomas, J. Attention aware systems: Theories, applications, and research agenda. *Computers in Human Behavior* 22(4). 2006. 557-587

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

Manuel João Caneira Monteiro da Fonseca (Investigador)

António Manuel Silva Ferreira (Investigador)

#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T3 - Group-level experimental setup

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-10-2007

30-04-2008

7

3

Resultados esperados

Expected results

- Descriptions of experimental setups (for high-level data acquisition)

This task will produce detailed guidelines for conducting controlled experiments in selected collaborative scenarios. These guidelines will include instructions about the definition and operationalization of the dependent and independent variables, group characteristics, collaborative task scenarios, computer devices, and adopted instruments for data acquisition. These descriptions of experimental setups are directed at studies of high-level attention management in CSCW (Task 4 focuses on the low-level aspects).

- Preliminary results from pilot experiments

These preliminary results will be used to guide the logistic aspects of the experimental evaluation and may include performance predictions (e.g. expected duration of each collaborative task scenario), last minute recommendations for handling the instruments, and instructions to be given to the subjects.

Descrição da tarefa

Task description

This task involves the preparation of the framework for formal validation which includes defining and operationalizing the dependent and independent variables, deciding about the group characteristics and the collaborative task scenarios, and determining the materials and instruments to be used. The adopted measurement instruments must allow analyzing group activities at the collaborative level (seconds to minutes). We consider computer logging and video recording of group activities.

Pilot experiments will be conducted to evaluate the detail, quality, and efficacy of the setups. In order to facilitate this process, we will adopt a canonical collaborative task for the pilot experiments, namely brainstorming, and use an existing tool developed by LaSIGE. This tool can be configured to operate with the various attentive devices and supports logging the users' interactions.

The attentive devices developed in Task 2 will be validated during the experimental setup to improve their efficacy in the planned scenarios. We also plan to conduct individual tests to compare attention similarities during collaborative and non-collaborative work (see Task 4). The collaborative work scenarios for pilot experiments will be characterized by groups of about 10 participants gathered in the same room and using the brainstorming tool in various configurations. Each session will last between 30 and 60 minutes, during which the tool measures group performance, such as the number of ideas and the time of inactivity immediately after the reception of new ideas from others. At the end, every participant will also fill out a questionnaire regarding the perceived state of attention during the brainstorming session. A preliminary version of this questionnaire has already been prepared and used in a pilot experiment with a group of 5 users.

Regarding the design of the controlled experiments, we plan to use the pre/post test, control group design, where we randomly assign subjects (in equal proportion) to either a control or an experimental group. We will perform pre-tests on the dependent variables (to obtain a baseline for later comparison), then manipulate the independent variable only for the experimental group (that is, activate the attentive devices), and then post-test the dependent variables. After all data has been collected we will conduct statistical tests to see if a significant change has occurred.



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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

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Marco Abelha César de Sá (Investigador)

António Manuel Silva Ferreira (Investigador)

#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T4 - Cognitive-level experimental setup

Data de início	Data de fim	Duração (em meses)	Pessoas * mês nesta tarefa
Start date	End date	Duration (in months)	Person * month in this task
01-10-2007	30-04-2008	7	3

Resultados esperados

Expected results

- Descriptions of experimental setups (for low-level data acquisition)

This task will produce detailed guidelines for conducting experiments at the cognitive level that may ultimately explain observed attention management during collaborative behavior using CSCW. These guidelines will include the selected low-level tasks, adopted instruments for data acquisition, and the precise framing within the full collaborative context (see Task 3).

- Preliminary results from pilot experiments

These preliminary results will be used to guide the logistic aspects of the experimental evaluation and may include performance predictions (e.g. expected duration of each low-level task), last minute recommendations for handling the instruments, and instructions to be given to the subjects.

Descrição da tarefa

Task description

- Define individual, task, context, and technological conditions

This task involves the preparation of the framework for formal validation, which includes designing the experimental conditions, identifying the instruments, and running pilot experiments.

- Define measurement instruments

The measurement instruments adopted for this task focus on analyzing individual actions at the cognitive level (seconds and less). We will utilize the following instruments:

Available at LaSIGE: neural interface; 3D orientation tracker.

The neural interface produces data suitable for electroencephalogram analysis, to determine, e.g., the alternation between automatic and manual modes of motor activity (cited in Chen and Vertegaal, 2004). In automatic mode processing requires almost no attentional resources thereby opening opportunities for parallel task execution (Sternberg, 2002).

The 3D orientation tracker may be used to determine the attentive state of the user, e.g., if the user is looking at a region of interest such as the computer screen. It lacks precision, however.

Requested by this project: eye tracker; screen recorder; pupil dilatation sensor; heart rate sensor; and eye blink sensor.

The eye tracker has been used in many experiments to capture the direction where the user is gazing at the screen, i.e., to determine the user's visual focus of attention (Zhai, 2003). We expect to use the data provided by the eye tracker to detect search/activity

patterns, calculate reaction times, and for other purposes that may indicate lack of or good attentive performance.

The screen recorder provides data about the user's interaction with the computer, depicting the screen contents, the mouse position, and other events that complement the data from the eye tracker.

The pupil dilatation, heart rate, and eye blink sensors provide physiological measures of mental workload that may help in determining opportune moments to interrupt the user (Iqbal et al., 2005; Rowe et al., 1998).

- Perform pilot experiments

Several pilot experiments will be conducted to evaluate the detail, quality, and efficacy of the low-level setups. This evaluation will be done in collaborative contexts (connected to Task 3) and will focus on a selected subject in the group.

#### References

Chen, D., Vertegaal, R. Using mental load for managing interruptions in physiologically attentive user interfaces. Extended abstracts of the SIGCHI conf. on Human factors in computing systems. 2004. 1513-1516

Iqbal, S., Adamczyk, P., Zheng, X., Bailey, B. Towards an index of opportunity: Understanding changes in mental workload during task execution. Proc. of the SIGCHI conf. on Human factors in computing systems. 2005. 311-320

Rowe, D., Sibert, J., Irwin, D. Heart rate variability: Indicator of user state as an aid to human-computer interaction. Proc. of the SIGCHI conf. on human factors in computing systems. 1998. 480-487

Sternberg, R. Cognitive psychology. Wadsworth Publishing. 2002. 65-107

Zhai, S. What 's in the eyes for attentive input. Commun. of the ACM 46(3). 2003. 34-39

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

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#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T5 - Evaluation

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-01-2008

31-03-2009

15

30

Resultados esperados

Expected results

- Results from laboratory experiments

- Insights on human attention during group work using CSCW

Descrição da tarefa

Task description

The evaluation method for this project is based on controlled experiments, designed according to the pre/post test, control group design. We will follow these steps:

- Prepare laboratory instruments and instantiate experimental conditions
- Gather subjects for the experiments
- Introduce subjects to the research (pre-experiment briefing)
- Randomly assign subjects to control or experimental groups
- Execute the experiments (including pre/post-test of the dependent variables)
- Answer questions subjects might have about the experiment
- Compare pre/post test data and conduct statistical significance tests

The purpose of this task is to formally evaluate the framework. This is a complex task since we expect the number of experimental subjects and variables to control to be high. This task requires significant cooperation between LaSIGE and INESC to prepare and run the experiments in both campuses. This task will be lead by INESC.

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

Pedro Alexandre de Mourão Antunes (Inv. Responsável)

Luis Manuel Pinto da Rocha Afonso Carriço (Investigador)

Manuel João Caneira Monteiro da Fonseca (Investigador)

António Manuel Silva Ferreira (Investigador)

Ricardo Jorge Jota Costa (Investigador)

#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T6 - Group performance model

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-01-2009

30-06-2009

6

6

Resultados esperados

Expected results

This task aims at delivering an engineering model of group performance based on the group attention framework and on the results from laboratory experiments using the attentive devices (the outcomes of Tasks 1, 2, and 5). The model may be used as a tool to characterize collaborative tasks, to predict collaborative performance, to detect usability problems, and to inform the design of CSCW systems.

We acknowledge that this is a very bold challenge, and accept that, in this project, we may lay some foundations using the gathered data, in anticipation of future research.

Descrição da tarefa

Task description

The challenging goal set for this task is developing an engineering model of group performance, based on the group attention framework and distilling the knowledge obtained from the laboratory experiments. We intend to use some of our preliminary work on workspace collaboration and group performance (Ferreira and Antunes, 2006a, 2006b), where we distinguish the following features: production, opportunities, and restrictions.

Production measures the distance between a prior and the current situations, utilizing the notion of "goal units" and assuming that the collaborative task may be specified as a discrete collection of goal units. Opportunities and restrictions are aimed at measuring the interdependent nature of collaboration, i.e., individual actions may positively or negatively influence the whole group performance, because the group task is not merely a collection of individual tasks. Restrictions reflect the negative dependence of the group on the individual actions, while opportunities account for positive influences to the group performance induced by individual outcomes.

This approach offers a structure for thinking about attention and applying that notion to measure group performance. This task will examine the relationships between production, opportunities, and restrictions, using the empirical tests performed in Task 5, to quantitatively estimate the impact of the attentive devices on group performance.

In this task we also intend to advance our previous work on the application of analytical task models to the group context (Ferreira and Antunes, 2006a; Antunes et al., 2006). Up until now our efforts were mainly oriented toward the analytical representation of collaborative activities among group members, but, for this project and this task, we plan to explore the use of task models to predict moments that minimize distraction due to interruptions. This idea has been tried before and existing results show that mental workload decreases at task boundaries (Iqbal et al., 2005), providing an opportunity to call upon the user's attention while maintaining good performance. However, to our knowledge, no study has been done with groups, and, therefore, we intend to investigate the relation between task models, attentive devices, and group performance.

References

Antunes, P., Ferreira, A., Pino, J. Analyzing shared workspaces design with human-performance models. Accepted for publication in:

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## Projectos de I&D

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

Pedro Alexandre de Mourão Antunes (Inv. Responsável)

Manuel João Caneira Monteiro da Fonseca (Investigador)

Marco Abelha César de Sá (Investigador)

António Manuel Silva Ferreira (Investigador)

Ricardo Jorge Jota Costa (Investigador)

#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T7 - Dissemination

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-07-2007

30-06-2009

24

12

Resultados esperados

Expected results

- Web site

- Published scientific papers

- Prototypes, demos, source code

- Technical reports

Descrição da tarefa

Task description

This task is dedicated to managing the dissemination of results. The dissemination of results will be conducted through various processes:

- Publications: the project activities will conduct to a significant number of publications, ISI journal papers and communications in conferences, in two major areas: Human Computer Interaction (HCI) and Computer Supported Cooperative Work (CSCW). The objectives set in this domain are feasible, although there is the risk inherent to proposing a new research agenda, as set in the project's goals;

- Workshops: this project regards as desirable and feasible to set up specialized workshops on Attentive User Interfaces in the two major Portuguese Conferences in the area (Encontro Português de Computação Gráfica, and Interação) which alternate bianually. These workshops will be fostered by the project participants, but will also be open to contributions from other researchers interested in this field.

- Public website: the project will create and maintain the A-CSCW Web site, where technical reports, experimental results, prototypes, demos, and source code will be available to the community.

## Projectos de I&D

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### Tarefa

Task

#### Referência do projecto

Project reference

PTDC/EIA/67589/2006

#### Membros da equipa de investigação que participam nesta tarefa

Members of the research team who participate in this task

Nome

Name

Pedro Alexandre de Mourão Antunes (Inv. Responsável)

#### Descrição da tarefa

Task description

Designação da tarefa

Task denomination

T8 - Coordination and management

Data de início

Data de fim

Duração (em meses)

Pessoas \* mês nesta tarefa

Start date

End date

Duration (in months)

Person \* month in this task

01-01-2007

30-06-2009

30

4

Resultados esperados

Expected results

- Kick-off summary (beginning of project)
- Progress reviews (quarterly)
- Review of each attentive devices
- Reviews of laboratory experiments
- Results review (end of project)

Descrição da tarefa

Task description

The organization proposed for the project is based on two basic principles:

- Simplicity
- Visibility

Considering there are only two partners in the project, the structure is necessarily simple and conflicts are resolved by the leaders of each research organization. The project will be organized according to quarterly progress assessments and formal project reviews at major milestones.

The major milestones defined for this project include:

- Project kick-off
- Review of delivered attentive device
- Progress review of preliminary experiments and experimental setups
- Review of laboratory experiments