

**STANDARD RESEARCH GRANT
IGR ASSESSOR'S COMMENTS**

15 SEP 2004

EPSRC

Engineering and Physical Sciences
Research Council

| | |
|---|---------------------------------------|
| 1. Grant Details | Grant Reference No(s) GR/N21062/01 |
| <p>Important: If you feel you may have a conflict of interest, or if you have a low level of confidence in your ability to provide an assessment of this IGR, please advise EPSRC before proceeding.</p> <p>In the case of a strongly multi- or interdisciplinary grant, please comment only on the elements of the grant within your area of expertise. Please say what this is in Section 4.</p> | |
| <p>Title: HIGH RESOLUTION THREE-DIMENSIONAL ULTRASOUND</p> <p>Investigator/Organisation: Dr R Prager/University of Cambridge</p> <p>In case of any query relating to this assessment contact Miss Toni-Jo Willcock and return your assessment of this IGR to them by: 14 September 2004.</p> <p>Assessor reference: B4ZLNN</p> | |
| 2. Your Assessment Please provide a narrative assessment addressing the following criteria and place a cross in the appropriate boxes. | |

Research Quality (Comment on the quality of the research undertaken, particularly its novelty and originality)

This is a high-quality research programme involving 3-D ultrasound and its further development. Novel ideas have been implemented to eliminate image artefacts eg. probe pressure.

The research quality was:

My confidence level in assessing this is:

| | | | | | |
|------------------------------|----------------|------------|----------------------|------------|-------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to | Of National Standing | Tending to | Internationally Leading |
| | | | | | ✓ |

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | ✓ |

Research Planning and Practice (Comment on the scientific/technological approach; suitability and effectiveness of the methodology, techniques, management and expertise; the extent to which planned and additional objectives were achieved; project management)

The approach has been incremental and the techniques implemented successful; wider clinical applications are now appropriate

The research planning and practice was:

My confidence level in assessing this is:

| | | | | | |
|------------------------------|----------------|------------|----------------------|------------|-------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to | Of National Standing | Tending to | Internationally Leading |
| | | | | | ✓ |

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | ✓ |

Potential Scientific Impact (Comment on the significance of key advances and the potential impact on other research)

Like all innovations in medical imaging it will take some time for the system developed here to have wide impact. However the potential application for breast cancer detection and treatment planning could be high.

The potential scientific impact is:

My confidence level in assessing this is:

| | | | | | |
|------------------------------|----------------|------------|----------------------|------------|-------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to | Of National Standing | Tending to | Internationally Leading |
| | | | | | ✓ |

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | ✓ |

Output of Research Staff (Comment on the level and quality of training and opportunity for career progression, the contribution to the provision of trained staff to meet national needs)

The publications and other forms of output is outstanding

The output of research staff was:

| | | | | | |
|------------------------------|----------------|-----------------|------|-----------------|------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Good | Tending to → | Outstanding ✓ |
|------------------------------|----------------|-----------------|------|-----------------|------------------|

My confidence level in assessing this is:

| | | |
|-----|--------|-----------|
| Low | Medium | High ✓ |
|-----|--------|-----------|

Communication of Research Outputs (Comment on the dissemination to other researchers; the extent and influence of relationships with research users [including other academics] and industry and the contribution to public understanding)

Staff involved in the project have received excellent training; one has gone on to securing a 5-year research fellowship

The communication of research outputs was:

| | | | | | |
|------------------------------|----------------|-----------------|------|----------------------|-------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Good | Tending to → ✓ | Outstanding |
|------------------------------|----------------|-----------------|------|----------------------|-------------|

My confidence level in assessing this is:

| | | |
|-----|--------|-----------|
| Low | Medium | High ✓ |
|-----|--------|-----------|

Potential Benefits to Society (Comment on the contribution to quality of life, relevance to beneficiaries, potential for exploitation, outputs and timescales).

As mentioned above there are some real potential benefits to patients.

The potential benefits to society is:

| | | | | | |
|------------------------------|----------------|-----------------|------|----------------------|-------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Good | Tending to → ✓ | Outstanding |
|------------------------------|----------------|-----------------|------|----------------------|-------------|

My confidence level in assessing this is:

| | | |
|-----|--------|-----------|
| Low | Medium | High ✓ |
|-----|--------|-----------|

Cost-Effectiveness (Comment on the cost-effectiveness and value for money of the project; use of resources, particularly staff, equipment and facilities; non-EPSRC contributions; follow-on support)

The collaboration with industry has been successful and overall the project gives value for money.

The cost-effectiveness was:

| | | | | | |
|------------------------------|----------------|-----------------|------|----------------------|-------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Good | Tending to → ✓ | Outstanding |
|------------------------------|----------------|-----------------|------|----------------------|-------------|

My confidence level in assessing this is:

| | | |
|-----|--------|-----------|
| Low | Medium | High ✓ |
|-----|--------|-----------|

3. Your Conclusions Please also use the space below to make any comments you may wish, relating to this proposal, not made elsewhere.

This is a well-managed research project with excellent output; the researcher should be congratulated.

Overall this IGR should be graded:

| | | | | |
|----------------|-----------------|------|-----------------|------------------|
| Unsatisfactory | Tending to ← | Good | Tending to → | Outstanding ✓ |
|----------------|-----------------|------|-----------------|------------------|

4. Your Area of Expertise Please indicate, in a few key words, your area of expertise relevant to your assessment of the grant.

Medical imaging, particularly magnetic resonance imaging, and its application in drug development.

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| Title: HIGH RESOLUTION THREE-DIMENSIONAL ULTRASOUND In case of any query relating to this assessment contact Miss Toni-Jo Willcock and return your assessment of this IGR to them by: 14 September 2004. | Investigator/Organisation: Dr R Prager/University of Cambridge Assessor reference: G1RVMZ |
| 2. Your Assessment Please provide a narrative assessment addressing the following criteria and place a cross in the appropriate boxes. | |

Research Quality *(Comment on the quality of the research undertaken, particularly its novelty and originality)*

High quality research from development of novel algorithms through to clinical application.

The research quality was:

| | | | | | |
|------------------------------|----------------|-----------------|-------------------------|-----------------|----------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Of National Standing | Tending to → | Internationally Leading |
| | | | | | X |

My confidence level in assessing this is:

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | X |

Research Planning and Practice *(Comment on the scientific/technological approach; suitability and effectiveness of the methodology, techniques, management and expertise; the extent to which planned and additional objectives were achieved; project management)*

Very sound experimental approach under-pinned by the development of novel algorithms for e.g. alignment. Excellent clinical collaboration. All the planned objectives have been achieved.

The research planning and practice was:

| | | | | | |
|------------------------------|----------------|-----------------|-------------------------|-----------------|----------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Of National Standing | Tending to → | Internationally Leading |
| | | | | X | |

My confidence level in assessing this is:

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | X |

Potential Scientific Impact *(Comment on the significance of key advances and the potential impact on other research)*

The image processing algorithms are novel and powerful, and are potentially applicable elsewhere e.g. in optical tomography. The combination of algorithms and calibration procedures has resulted in a very significant increase in system precision.

The potential scientific impact is:

| | | | | | |
|------------------------------|----------------|-----------------|-------------------------|-----------------|----------------------------|
| Criteria : Not Applicable | Unsatisfactory | Tending to ← | Of National Standing | Tending to → | Internationally Leading |
| | | | | | X |

My confidence level in assessing this is:

| | | |
|-----|--------|------|
| Low | Medium | High |
| | | X |

Output of Research Staff (Comment on the level and quality of training and opportunity for career progression, the contribution to the provision of trained staff to meet national needs)

The postdoc RA on the grant, Dr Treece, has gained an RAEng/EPSRC Fellowship, which is highly commendable. The clinician, Dr Cash, clearly played a significant role in the success of the clinical elements of the project, and is working towards an MD.

The output of research staff was:

| Criteria : | Unsatisfactory | Tending to | Good | Tending to | Outstanding |
|----------------|----------------|------------|------|------------|-------------|
| Not Applicable | | ← | | → | |
| | | | | X | |

My confidence level in assessing this is:

| Low | Medium | High |
|-----|--------|------|
| | | X |

Communication of Research Outputs (Comment on the dissemination to other researchers; the extent and influence of relationships with research users [including other academics] and industry and the contribution to public understanding)

Excellent communication of research outputs - good publications, an informative web site, and good working relationship with industry.

The communication of research outputs was:

| Criteria : | Unsatisfactory | Tending to | Good | Tending to | Outstanding |
|----------------|----------------|------------|------|------------|-------------|
| Not Applicable | | ← | | → | |
| | | | | | X |

My confidence level in assessing this is:

| Low | Medium | High |
|-----|--------|------|
| | | X |

Potential Benefits to Society (Comment on the contribution to quality of life, relevance to beneficiaries, potential for exploitation, outputs and timescales).

Difficult to quantify. Ultrasound scanning has become an extremely important modality for non-invasive imaging, but the ability to produce high-quality 3d images has been considerably less than e.g. MRI. The work performed in this project clearly shows that high quality 3d imaging is possible with ultrasound, and this is bound to have a major impact.

The potential benefits to society is:

| Criteria : | Unsatisfactory | Tending to | Good | Tending to | Outstanding |
|----------------|----------------|------------|------|------------|-------------|
| Not Applicable | | ← | | → | |
| | | | | | X |

My confidence level in assessing this is:

| Low | Medium | High |
|-----|--------|------|
| | | X |

Cost-Effectiveness (Comment on the cost-effectiveness and value for money of the project; use of resources, particularly staff, equipment and facilities; non-EPSRC contributions; follow-on support)

A good investment.

The cost-effectiveness was:

| Criteria : | Unsatisfactory | Tending to | Good | Tending to | Outstanding |
|----------------|----------------|------------|------|------------|-------------|
| Not Applicable | | ← | | → | |
| | | | | X | |

My confidence level in assessing this is:

| Low | Medium | High |
|-----|--------|------|
| | | X |

3. Your Conclusions Please also use the space below to make any comments you may wish, relating to this proposal, not made elsewhere.

Top quality engineering research feeding directly into clinical application.

Overall this IGR should be graded:

| Unsatisfactory | Tending to | Good | Tending to | Outstanding |
|----------------|------------|------|------------|-------------|
| | ← | | → | |
| | | | | X |

4. Your Area of Expertise Please indicate, in a few key words, your area of expertise relevant to your assessment of the grant.

Medical engineering, computational modelling of biological systems.